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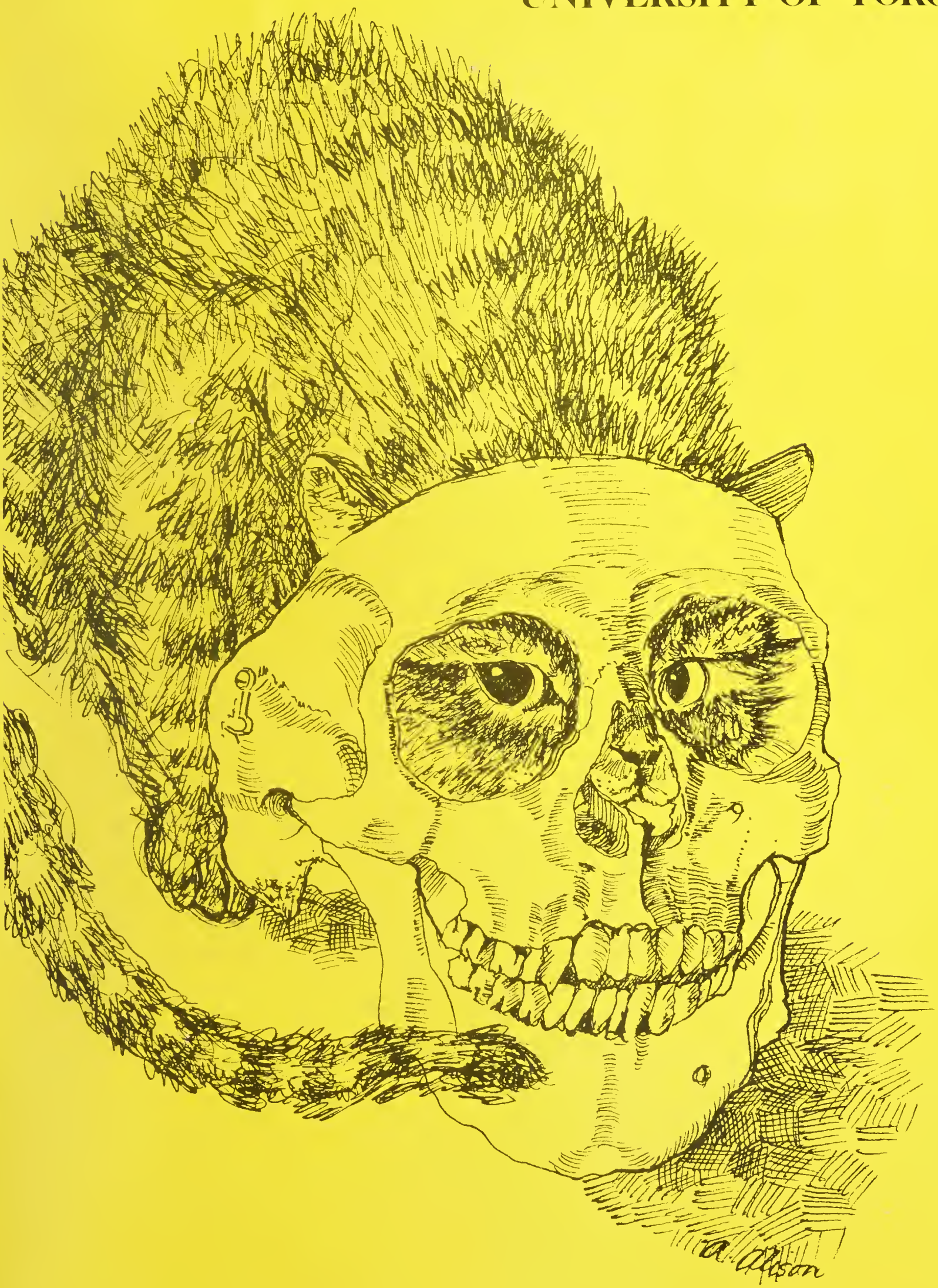

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GUIDELINES FOR PUBLICATION

1) All articles intended for publication should be submitted to the editors before the deadline which is usually *six* weeks before the release of the Journal
2) Submitted articles should be typed (or legibly printed) double-spaced, single-sided on paper 8½" x 11" (letter size) and they should not be more than 15 to 20 pages (3000 to 4000 words)
3) Illustrations, graphs, diagrams and figures should be put on a separate sheet and identified by Arabic numerals A list of explanatory legends for all the figures and diagrams should be put on another sheet Do not write on the back of photographs
4) References should be checked with the original sources, designated by Arabic numerals in the text, numbered in order of appearance and put on a separate sheet. Each periodical reference should include in order the author's name and initials, title of the article, Journal name, volume number, page number and year (eg., 1 Rosen HJ: Lumbar Invertebral disc surgery: review of 300 cases *Can Med Assoc J , 101 317, 1969*)
5) The editors reserve the right to make such editorial changes as are deemed necessary to ensure correctness of grammar and spelling, clarification of statements and conformity to Journal style
6) Acceptance for publication is subject to the understanding that such material is submitted solely to the Journal and will not be reprinted without the consent of both the editors and author

The Medical Illustrator

Bev Ransom A.A.M.

Do not underestimate the role of the Medical Artist! His responsibility as visual communication specialist is immensely important in education today. Medical knowledge and communication techniques are expanding rapidly. In the words of Professor Nancy Joy, Director of the Department of Art as Applied to Medicine, "He must be a born teacher, an artist by vocation and a scientist by nature".

The significance of the role of the medical illustrator may be first examined by looking at the attempts of other cultures to communicate visually long before the days of television, film, photography and printing. In ancient times, the only way to convey efficient instructions in certain practical techniques of medicine was to present a drawing of the procedure. The drawing was not merely an accompaniment to a text but was often the essence of the instruction.

The Beginning

Medical illustration can be traced back to Hellenic Alexandria of the late fourth century B.C. Such work was used by two prominent anatomists, Herophilus and Erasistratus, as teaching aids. Schematic diagrams, along with naturalistic depictions of events were used. In fact, the medical illustrations of antiquity contained all categories of modern illustration: the schematic, diagrammatic and naturalistic.

The early sixth century Vienna codex of the Roman physician, Dioscorides, on *materia medica* demanded that plants used for medicinal purposes be properly and accurately identified in a drawing! Records of surgical work from the Islamic culture, written in the tenth century, contain illustrations of a complete range of surgical instruments with explanations of their use. In this way, the surgeon could convey to the cutler or blacksmith a design which could be understood at a glance. Many surgical procedures depicted in medieval miniatures are fine examples of primitive art as well as clear guides to the surgeon dealing with fractures, the location of incisions for bleeding purposes and so on.

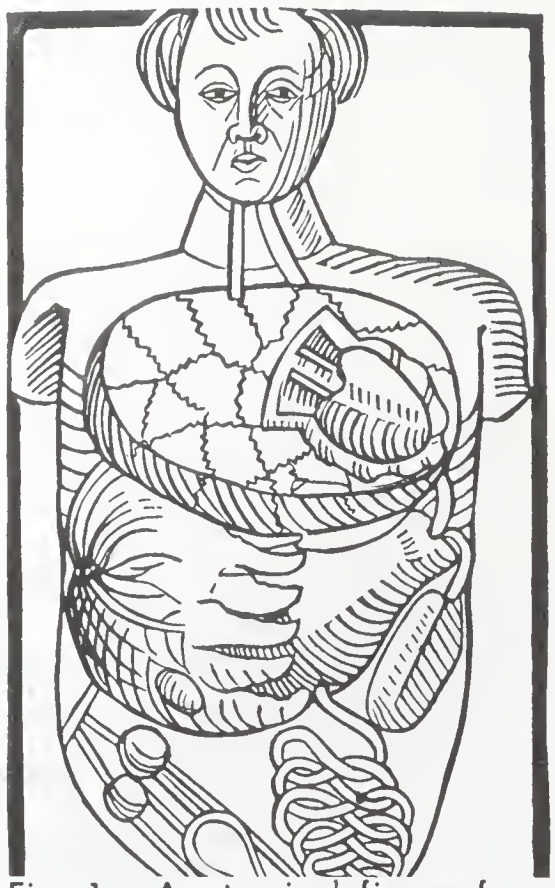

Fig. 1 - Anatomical figure from Magnus Hundt, 1501. Note especially the five lobed liver which, as Choulant points out, derives from an old Galenic error based on animal dissection.

Illustrations created in ancient times were used thereafter for 1,200 years as references well into the middle ages because the religion of the Romans, and particularly of the Arabs who followed them, prohibited human dissection and even the graphic depiction of man's anatomy. Galen (200 A.D.), restricted to the dissection of animals, provided inaccurate depictions of human anatomy for many centuries of scholars.

Medical illustrations from the past hold not only important value as medical documents of the history of medicine, but they are of great value to the history of art as well. The use of charts, diagrams and statistical tables of great importance in the communication of medical information, marks the beginning of quantitative thought, the advent of modern medicine. This has concomitant significance to the history of thought.

Leonardo

As Leonardo da Vinci, "The Father of Medical Illustration", studied human anatomy in the early 16th century, a study commonly taken up by artists, he found that text books gave information which conflicted with his own observations. He decided (as Vesalius, another artist, would do) to write his own textbook. Leonardo's work was an essential

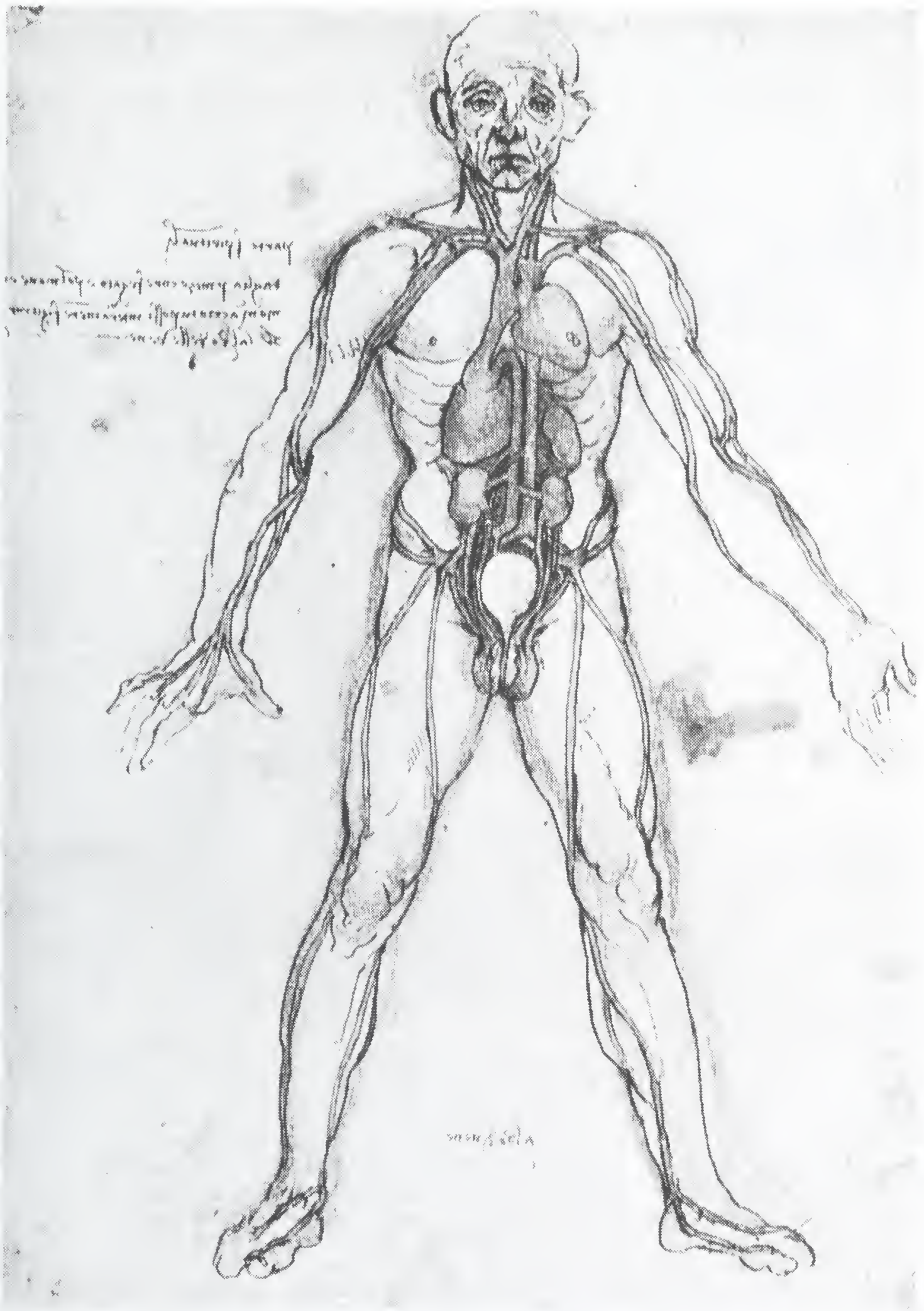

Fig. 2 - 'Large Vein Figure.' Quaderni V^R, Windsor 12579, before 1500. The deep vessels are 'reconstructed' from Mondino, the superficial vessels reproduced from observation.

Fig. 3 - Drawing of the detail of the skull by Carolynne Teare, year III, A.A.M.

basis for the study of man, whereas Vesalius' (1543) purpose was to serve surgery rather than medicine as a whole.

For Leonardo, illustration had precedence over text. He wrote in 1510, *"Dispel from your mind the thought that an understanding of the human body in every aspect of its structure can be given in words; for the more thoroughly you describe, the more you confuse; it is therefore necessary to draw as well as to describe".*

Because Leonardo was not only an anatomist and graphic artist, but also an engineer and architect, his approach to analysing the human body took on new dimensions—putting him ahead of his time in graphic techniques of communication as well as of thought. Unlike his predecessors, he undertook the illustration of different systems of organs in logical succession, the graphic presentation of true measurements and spatial relationships, the relationships between musculature and skeleton, surface anatomy, and cross-sections (frontal, sagittal, and transverse) especially of the skull.

Unfortunately, Leonardo's work remained hidden from the world, not to be published until the late 19th century. Thus, the work of Vesalius first established the new science of anatomy based on direct observation. This occurred about 25 years after Leonardo's death with the publication of Vesalius' textbook *Fabrica* in 1543. We see that although da Vinci was forerunner of the new anatomy, Vesalius was its founder. Their goals to improve the study of anatomy and establish an artistically beautiful approach to medical illustration are still pursued to this day! The medical illustrator strives for these goals as a scientific investigator whose skills as an observer are critical in recording scientific events.

Science and Art- An Odd Combination!

Sometimes science and art are diametrically opposed disciplines, one involving a subjective and emotional interpretation of reality, the other involving an objective, unemotional and relatively rigid mode of scientific observation. The medical artist, however, brings science and art together. He and the medical scientist appreciate the order and harmony of living things and strive to understand it. The artist's process of inquiry is a slow and contemplative one wherein the subject must be felt and thoroughly understood in depth. The tactile quality of art, once visualized for the student, is an important aid in learning.

Max Brödel (Broedel), an American artist of German birth, revolutionized medical illustration and founded the world's first School of Medical Illustration at Johns Hopkins University in 1911. It was Brödel who set the high standards held in the field of medical illustration, beginning with the following qualifications for entry to his school:

1) Keen interest in science, nature and all living things.
2) Ability to study intelligently, to observe accurately and to doubt the word of authority.
3) Ability to draw and paint from nature free hand and with artistic charm.
4) Ability to visualize, to imagine a picture based on previous study and then give it reality on paper.
5) Technical skill in drawing, a trustworthy eye guiding an obedient hand.
6) Good health and normal vision.

Art as Applied to Medicine —U.ofT.

The selection of A.A.M. students at the University of Toronto involves three steps. There is an initial interview to determine the qualifications of the prospective student who must have at least 2½ years of art training, Grade 13 biology and preferably, Chemistry. His or her commitment to the field is immensely important as few students (5) are selected each year. The academic standing and portfolio of the applicant are examined next by professionals in the field as the candidate tours the working environment of practising medical artists. Finally, a panel of professional medical artists review closely all aspects of the candidate's work.

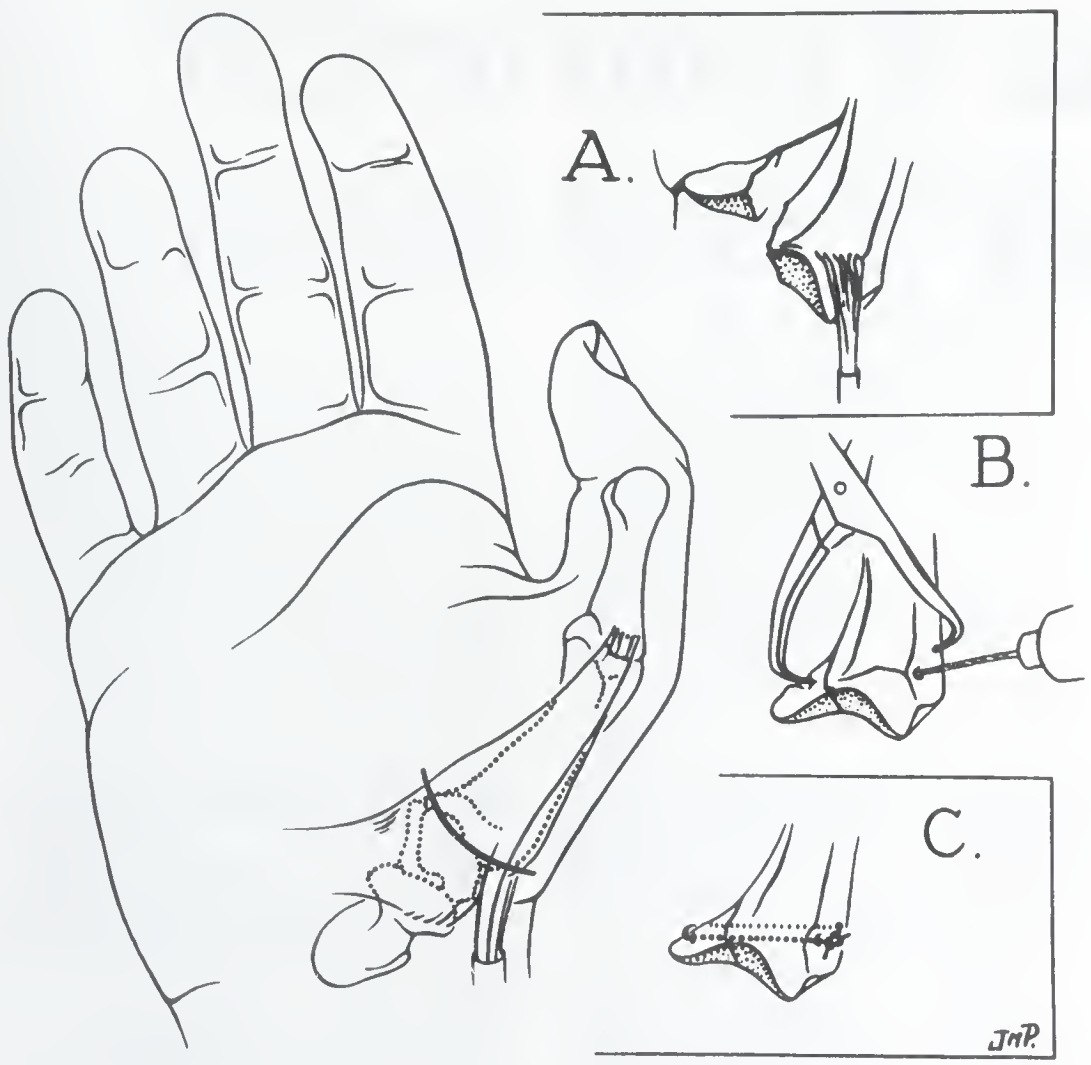

Fig. 4 - The artist must simplify, clarify and emphasize important details by leaving out extraneous visual clutter. He must also illustrate processes and concepts involved in medical procedures.

The three year course at the University of Toronto through which the student earns a B.Sc. in Art as Applied to Medicine, (B.Sc.A.A.M.), is designed to give the medical artist full understanding of the human body, encompassing such topics as gross and neuroanatomy, histology, pathology, oral anatomy, physiology and others.

Various media and techniques are learned and valuable experience is gained. These include surgical drawing in the operating rooms at Sunnybrook and Toronto General Hospitals, the use of gouache, carbon dust, airbrush, pen and ink, graphs and charts, photography, animation and television production.

Graduates may continue their studies to earn an M.A. in areas of Educational Theory, Anatomy, Botony or Zoology, Museology, Physical Anthropology and the professional M.D. program.

The Medical Artist Today

Medical artists work in schools, clinics, research laboratories, hospitals, pharmaceutical companies, museums, for individual physicians or as free lance artists — wherever there is a need for an illustrator of medical science.

The work of a skilled media specialist is also needed because drawings accompanying medical research papers may be refused today due to the higher reproduction standards of publishers who are themselves involved in a competitive field.

Perhaps the artist cannot compete with the camera's ability to record the actual appearance of objects, but only the artist can simplify, clarify and emphasize important details by selectively leaving out extraneous visual clutter. Illustration and photography, both full time specialities in themselves, may be used together towards the completion of a project, but only the artist can effectively demonstrate function, relationship, motion, pressure, tension and the sequence of concepts and procedures.

The profession of Medical Illustrator is a newly recognized one. The significance of medical art, however, dates back to antiquity, claiming a place in the enlightment of man and a continuing role in the teaching of human biology. □

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At The FrontierOf Cancer Treatment

Lin Leung 8T1

Few diseases cause as much emotional trauma among the ill and their relatives as cancer. The disease claims over 33,000 lives in Canada each year, ten times this number in the U.S., approximately 20% of total deaths of all causes. Hundreds of millions of dollars are spent yearly on cancer research and trials. No panacea has, as yet, been found for this unrelenting killer of mankind. However, cancer survival is going uphill slowly and investigators are cautiously optimistic that ways will be found to cure the disease.

The following is a summary of some new methods in the detection and treatment of cancer that have been reported in the last few years. It must be emphasized that none of these methods has gained wide acceptance in the medical community. Most of them are still experimental or are undergoing preliminary clinical trials. Nevertheless, they shine some hope and inspiration on us all and serve to illustrate the complexity and diversity of the approach to the cancer problem.

Cancer Detection

Many cancers cannot be located in the body by the conventional x-ray scan until they have advanced to a rather late stage. An ideal method for early detection would therefore be one which is capable of revealing malignancy on a routine blood test. The possibility of a cancer marker has been reported by a Harvard team. They measured an abnormal isoenzyme of the serum protein galactosyl transferase GT-II which is apparently manufactured by malignant tumors. The team found the protein in 71% of patients with a variety of cancers.

In addition, researchers from the University of California at Los Angeles and the University of Pennsylvania reported that cathepsin B-1 activity was elevated 41.6% over normal in females with vaginal adenosis, who are daughters of mothers previously treated with DES (diethylstilbestrol) for the prevention of miscarriage. The serum concentration of this enzyme was 1263% over normal in those with dysplasia in addition to adenosis and a higher level still (4742%) in those with confirmed clear cell adenocarcinoma of the vagina.

A team of Belgian researchers believes that a battery of simultaneous cancer antigen measurements (kappa-casein, carcinoembryonic antigen, alpha-feto protein, human chorionic gonadotrophin (HCG) and the beta subunits of HCG) may give a six-month advanced warning against cancer recurrences or spread, thus permitting effective changes in therapy long before other clinical signs appear. The battery test may be of special value in picking up hard-to-diagnose cancers such as pancreatic malignancy and the team is now initiating a trial with 500,000 workers in an industrial area.

Locating disseminating cancer is particularly difficult. Investigators from Harvard Medical School were able to pin-point the lymphoid mass in Hodgkin's disease patients by injecting a ^{131}I-labelled lymphoid specific antibody via the intralymphatic route. The radio-labelled antibody binds tumor antigen and the pattern of localization was stable up to five days.

A new test for prostate cancer by counter-immunoelectrophoresis is being promoted by researchers at the Roswell Park Memorial Institute to be part of any routine comprehensive health examination for adult males. The test detects acid phosphatase and is being tried on almost 19,000 persons in 18 U.S. centres. The early data show 86-90% positive for untreated cases and a very low false positive rate. The method is claimed to be superior to the old chemical detection method which detects elevated levels of acid phosphatase only after the cancer has spread and has a significant practical advantage over the radioimmune assay method in terms of economy and time as well as technical simplicity.

Breast cancer claims 1200 lives a year in Ontario alone and new cases turn up at a rate of 2400/year in this province. Although, self-breast examination remains an important strategy, mammography will continue to benefit those who are over 50 years old. The dose of radiation has been reduced to ½ rad, about one third or one quarter of the dose used merely 3 years ago. However, it has been shown that DES women have 76% excess tendency to develop breast cancer. For these females, clinicians hesitate to screen them with mammograms, fearing

that DES and mammography may act synergistically to cause breast cancer.

Non-invasive methods for breast cancer screening, are now being developed. The graphic-stress telethermometry method, refined by the Sloan-Kettering Institute, uses infrared heat probes to measure the temperature differences between the nine breast segments and the patients' forehead before and after the patient immerses her hands in ice water for 15 seconds. The possibility of malignancy is indicated if a breast segment does not drop in temperature along with the forehead, or if one segment is a degree higher than other segments. The half hour test is 82% accurate. The test is much less costly and can be used to determine who should have mammography.

Diaphanography is another non-invasive method recently refined by some Swedish investigators for detection of breast cancer. The method uses a dim, cool lamp to spread light evenly throughout the breast in a room lit by a red lamp. A photo with infrared film is taken. A healthy breast filters the light evenly and appears yellow in the photo. Fibroadenoma and other benign changes show up as red. Malignant changes appear dark brown or black. The Swedish researchers claim an accuracy rate of 90% and have initiated a study involving 5,000 patients at the Huddinge General Hospital in Stockholm.

Lung cancer detection has always been a challenge to physicians. With the aid of sputum cytology to identify the presence of cancer cells, resectable lung tumors can now be routinely located with flexible fiber optic brush biopsy. The method is capable of locating tumors as small as 1 mm in diameter which in invisible on x-ray.

Cancer Treatment

In the traditional treatment methods, solitary cancers are removed by resection. When surgery falls short, the oncologists turn to radiation and chemotherapy, which both have a hard time telling friends from foe. Healthy tissues, especially bone marrow and intestinal epithelium are threatened along with the tumor. Therefore, doses of drug and radiation must be well below optimum tumoricidal levels. This situation, however, may soon be changed. Investigators from Houston and Harvard found that total parenteral nutrition (TPN) boosted the cancer patients' tolerance of high doses of radiation and chemotherapy and minimized their surgical complications. The patients appeared to have better tumor response to the drugs. Surgeons from the University of Toronto also reported that parenteral feeding reversed or prevented malnutrition in 65 children having intensive cancer therapy and that 31 of them could continue full-dose chemotherapy and radio-therapy while on TPN. The TPN regimen is extremely costly. The role of nutrition in cancer patients has long been a neglected field. There is no doubt that it will become increasingly important in the next few years.

The Hyperthermia Method

Another approach to cancer treatment, based on a possible difference between cancer cells and normal cells in their sensitivity to temperatures, is hyperthermia therapy. In a British study, terminal cancer patients were mummified in molten wax and inhaled heated air to induce body temperture to 107°F. These patients were reported to have a remarkable feeling of well-being, less pain or even no pain, and a return of appetite and weight gain. Some even returned to work. This improved clinical picture was substantiated by radiologic evidence of some tumor regression, results from tissue biopsy and biochemical analysis of tumor degradation products. Heated perfusion of melanoma patients' hands or feet was also observed to bring about a five-year survival rate of 72% in 165 patients by a hospital in Houston. Clinical trials on terminal cancer patients using focal microwave was claimed to greatly alleviate symptoms and promote regression of tumors of these patients by researchers in Rochester. While there is great therapeutic potential recognized in the hyperthermia method, it carries the risk of overloading the body with massive dead cell products. Furthermore, the amount and duration of heat application must be skilfully regulated to ensure preservation of normal tissues.

Chemotherapy

Chemotherapy is most successful in the treatment of acute lymphoblastic leukemia in children, which has a 70% cure rate. Most adult leukemias are of the chronic lymphocytic type. Total body irradiation plus cyclophosphamide and prednisone have achieved 50% remission in these patients.

5-Flurouracil as adjuvant to surgery benefits patients with colorectal cancer and other gastrointestinal cancers while the combined use of platinum, vinblastine and bleomycin was reported to improve the prognosis of testicular cancers. Cis-diamine-dichloroplatinum (cis-DPP), despite its renal and otic toxicity, is being increasingly used for cancers other than genitourinary tumors. Head, neck and lung malignancies as well as osteogenic sarcoma appeared to yield to this treatment. An antihelminthic agent, levamisole, has shown promising results when used together with surgery. The cancers responsive to this drug include brain, bone, mediastinum, kidney and liver.

Phosphonacetyl-L-aspartic acid (PALA) is an inhibitor of the enzyme aspartate transcarbamylase which is essential for DNA and RNA synthesis. This drug was found to be effective against slow-growing tumors and has been incorporated into a muti-centered clinical trial in the U.S.

The drawback of all existing anticancer drugs is that they kill cancer cells as well as normal cells indiscriminately. A much less toxic chemical, dimethyl formamide, could be the compound that works in a benign new way to tackle malignancy. This chemical, although still in the mouse and glassware stage, miraculously converts the randomly growing cancer cells to a normal monolayer of parallel cells. The agent, when injected into mice, brings regression of large tumors resulting from implanted human cancer cells.

But, the hottest new anticancer drug is thymidine, a DNA component. It is so hot that millions of

early-risers watching ABC's "Good Morning, America" learned of the official permission for the clinical trials at dawn one day last October. The compound halts division of cancer cells but not normal cells, causes dramatic regression of tumors in mice and boosts up white cell counts in patients. At present, thymidine of 1,000 times its normal blood concentration, must be given to patients to counteract its rapid degradation by blood enzymes. The drug, however, appears to have little toxicity.

Breast Cancer

Breast cancer has always captured the keen interest of oncologists. Because of its prevalence, the progress in its treatment deserves some elaboration.

Cyclophosphamide-methotrexate-5-fluorouracil (CMF) used as surgical adjuvants are continuing to compile a good track record in prolonging survival, not just disease-free intervals, for breast cancer patients. Many oncologists consider commencing chemotherapy within a few weeks after mastectomy in patients who have positive nodes. In a large-scale study conducted in the U.S. and Italy, a three-year survival rate of 91% was achieved with patients treated this way, compared with 80% survival rate of the control patients. Premenopausal woman appeared to benefit much more from this treatment than postmenopausal women, possibly due to hormonal differences between them.

Hormonal therapy has long been a major manipulation in breast cancer patients with metastases. The invention of radiochemical assays for the progesterone and estrogen receptors on biopsy material recently has changed the indiscriminate use of hormonal therapy. Most oncologists agree that if the estrogen receptor is absent, oophorectomy, adrenalectomy, hypophysectomy and additive hormonal administration are contraindicated. Patients in whom both receptors are absent will not respond to hormonal therapy. When the estrogen receptor assay is positive and progesterone receptor assay negative, 39% respond, according to the researchers in the Case Western Reserve University. If both assays are positive, 67% of such patients had objective remissions to hormonal manipulations, and if the assay tissue came from biopsies of metastases in lymph nodes, skin, liver or elsewhere, 81% of such patients responded to hormonal treatment. As a result of such clinical findings, the estrogen receptor test has become standard in many major medical centres and community hospitals where breast cancer is treated.

The humiliation and anxiety experienced by women who have lost their breast through mastectomy is something few men can appreciate. Until now, fewer then 1% of American females who had undergone mastectomy had a new breast constructed. But recently, surgical skills have developed to reconstruct a breast even after radical mastectomy. For example, the latissimus dorsi muscle can be pediclegrafted to replace a pectoralis major removed in a Halsted procedure.

How soon can a reconstructive operation be done after mastectomy? According to the plastic surgeons, reconstruction often can be carried out at the same operation for stage 1 cancer. If the lesion is smaller than 2 cm and there are fewer than three positive axillary nodes, the patient is suitable for breast reconstruction at any time. With invasive carcinoma, but a good prognosis, some surgeons wait for three months. Breast reconstruction indicates no increase in cancer recurrence thus far. The only potential hazard is found when patients are on adjunctive chemotherapy which can depress white cell counts, posing a risk of infection. The principal complication is late fibrotic capsule formation around the gel prostheses in some cases.

Immunotherapy

BCG vaccine has been tried in many centres to boost the immunological defense in cancer patients. In stage 1 lung cancer, a single injection of BCG into the pleural cavity after pneumonectomy or lobectomy continues to benefit patients. A Paris team observed a 66% two-year survival rate for BCG recipients versus 38% for those who had surgery alone. The benefit of BCG in the more advanced lung cancers is, however, uncertain. The compound appeared to minimize toxicity in patients undergoing chemotherapy with 5-fluorouracil.

Another compound that has potential as a rather safe anticancer drug is thymosin. It alters the immunological character of thymic cells. It was given to some 200 cancer patients in a trial supervised by the U.S. National Cancer Institute. One hundred and forty patients demonstrated improved immunologic parameters usually correlated with a later positive clinical course. The drug has no apparent side effects even after 18 months of administration.

Some Japanese investigators found white blood cell transfusion into the brain tumor after surgery increased the two-year survival rate by 65%.

But the greatest excitement among immune cancer oncologists is the discovery of the tumoricidal effect of interferon, a protein produced by body cells. The anti-cancer effect reported by the Swedish investigators and some U.S. oncologists is so promising that the American Cancer Society has just ordered $2 million worth of 40 billion international units of partially purified human leukocyte interferon from Finland to try on approximately 100 to 150 cancer victims of six tumor systems. The types of cancer to be investigated include breast cancer, melanoma, bladder and prostate cancer, non-Hodgkin's lymphoma and multiple myeloma. The Swedish oncologists have been giving interferon to cancer patients since 1971—3 million units a day IM, for a month, to osteosarcoma patients commencing right after surgery. They have treated 34 patients thus far and achieved a 73% 2½ year survival free of metastases, compared with 35% in a concurrent control group. Furthermore, the 50 or so cancer patients so treated have remained free of viral infections that plague most victims of malignancy and most of these patients have retained their immunocompetence. Meanwhile, investigators in the United States observed that interferon induced remissions in breast cancer and was effective against infections of herpes zoster, chicken pox, rubella and chronic hepatitis.

The regression of tumors occurred rapidly and the macrophage activity rose markedly.

If a certain virus can cause cancer and if we know the viral origin, for instance Epstein-Barr virus and Burkitt's lymphoma, should we make the vaccines and apply them to humans? Here is what the Nobel Laureate, Dr. Howard Temin said about the idea of cancer vaccines, *"When you manipulate the immune system, it is not easy to predict what will happen. And finally, you may give the patient a completley different disease. What is more, it might take an entire lifetime to find out what the anti-cancer vaccine had wrought, by which time, it will be too late."*

The Laetrile Issue

It is estimated that between 50,000 to 100,000 cancer patients in the U.S. thrive on Laetrile, an apricot-pit extract advocated by its proponents to be the wonder drug of cancer. After 15 years of refusing to test Laetrile on humans because of unconvincing efficacy of the drug on experimental animals, the U.S. National Cancer Institute finally decided to allocate $250,000 for a one year clinical trial of the chemical on terminal cancer patients in an attempt to resolve the matter once and for all. The NCI has just concluded a retrospective nation-wide survey in which appeals were sent to 385,000 physicians and 70,000 allied health professionals to report on the use of Laetrile. Ninety-three responses were recorded, of which 26 were insufficient for assessment. The final analysis of the remaining 61 patient records revealed that six of a possible 75,000 American cancer victims who received Laetrile for their disease may have benefited from it. This statistic is not much different from spontaneous regression of cancer, an enigma that forever fascinates physicians. The director of the trial emphasized that the trial did not aim to satisfy the pro-Laetrile movement which is determined to accept nothing but a positive effect — even if it does not occur. It is hoped that a negative result will strengthen the stand of physicians in explaining to their concerned patients why "they can't as least try Laetrile".

Heroin as a Pain Killer

While new cancer treatment methods are mushrooming, there has, regrettably, been little done to improve the comfort of terminal cancer patients for whom our ongoing projects are almost irrelevant. Finally, North America has started its first experiment on the efficacy of heroin in the palliation of the severe pain that is the dread of every cancer patient. Heroin has been used on cancer patients in Britain for the last ten years and has been enthusiastically advocated by the St. Christopher Hospice as part of what is called the Brompton cocktail—a mixture of heroin, cocaine, phenothiazine, alcohol and chloroform. The analgesic effect of heroin has been claimed to be superior to morphine by some British researchers. Unlike morphine, heroin does not cause nausea and constipation.

Nutrition and Cancer

Finally, does anything we eat have a preventive value against cancer formation? Apart from the possible benefit of a more fibrous diet, researchers at Princess Margaret Hospital and elsewhere reported preliminary findings that 400 mg vitamin C and E daily reduced the density of colon polyps to 35% of its original value in patients who had been placed on this regimen for 34 months. These compounds presumably act as antioxidants to block the formation of the carcinogenic nitrosamines in the intestine. If this turns out to be true, we shall have taken a giant step forward in combating colon cancer which at the present has the highest incidence of all cancers in man.

Summary

In the war on cancer mankind has raged, there has not emerged a clear winner. New technology and chemicals are mushrooming, yet no one is sure how close we are to a definite "cure" for cancer. The latest agents being hailed as cancer panaceas are interferon and thymidine. The excitement surrounding these compounds has been ignited by their tumoricidal effect as well as the fact that both agents, because they are produced by the body itself, are essentially nontoxic. However, it will be years before verdicts on the efficacy of these compounds are handed down. Much hope has been placed on immunotherapy and harnessing the immune system to our call — the most formidable task of all. Yet even if these new methods are found effective, they will not replace the surgeon's knife, the radiotherapist's beam, or the chemotherapist's drugs. For only after the number of cancer cells in the body has been reduced to a minimum, is it believed that natural factors such as interferon, thymidine, macrophages and their friends can move in to wipe out the last few cancer cells. Only them can we proclaim a definite cure for cancer.

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William Lyon Mackenzie King: The Defense Mechanisms Of A Social Reformer

Lynn McIntyre 8T0
Joel J. Jeffries M.D., F.R.C.P.(C)

William Lyon Mackenzie King was Canada's longest serving Prime Minister. He is also recognized as one of our most distinguished social reformers. Indeed, his last significant political act was the introduction of family allowances just after the end of World War II. He must have felt proud of that act as he always considered himself the great friend of the poor.

The path to becoming a social reformer is doubtless a multi-determined one. This study seeks to trace one trail of King's psychological development that led him away from his ambition of clergyman into the role of social reformer, politician and ultimately, Prime Minister.

It is possible to follow King through these developments because of his meticulously kept diaries. He began his diaries in 1893 at age 18 while a student at the University of Toronto. He recorded most of his personal and political life in the diaries until his death in 1950. The diaries are unusually self-revealing and provide remarkable insight into this successful, but troubled man.

As famous as King, is his mother, Isabel, and that is where we begin. Numerous diary entries reveal King's erotic feelings towards his mother.

> 'I must do more for Mother. Make her life happier, she loves me dearly and no love like mother's love ever was known.' (May 9, 1898).

Mrs. King is reported to have been a beautiful woman and King was very aware of how his mother looked and he treasured her photographs.

> 'Mother too is as fine a looking woman as I have ever seen.' (Sept. 4, 1899).

> 'On coming to my room tonight I rec'd proofs of mother's pictures but was greatly disappointed in them, seemed to see that she was getting older, some of the photos were in low neck. I did not care for them at all, at first, did not want that sort of a photo of Mother.' (March 3, 1899).

> 'He looked at the photos I had and admired mother's face very much. It is a very lovely face. I have seen few faces in the world that can compare with it in purity and loveliness, tenderness and refinement.' (April 20, 1899).

> 'I see no woman as beautiful as Mother.' (June 21, 1899).

> 'I will have 2 steel finish, both splendid photos of mother, true likenesses, full of character.' (Aug. 11, 1899).

The subtelty of his erotic feelings towards his mother is expressed in various ways.

> 'If I can only win such a wife as I have such a mother, how infinitely happy!' (July 29, 1899).

> 'Mother came to my room and laid out my nightgown for me, her hair was silvery as she descended the stairs.' (Aug. 10, 1899).

King became disillusioned with his financially inept father in his early twenties, concomitantly with his growing admiration of his mother. His mother complained to him privately about Mr. King and following a number of diary entries critical of his father, he noted:

> 'I rec'd a letter from Mother and father today both glad I had returned here'. (January 16, 1897).

The difference in capitals may reveal King's unconscious attitude towards his parents.[7] After this date, mother is frequently written with a capital M (except during her opposition to his proposed marriage to a Chicago nurse, Mathilde Grossert), whereas the f in father is consistently lower case. This idealization of his mother and debasement of his father is seen in the following diary entry:

> 'Father possesses an exceptional gift for literary work, and had he devoted his life to academic work would have made a splendid work. I lose all patience with him at time when he lets the days and months slip by without giving much to them in the way of literary effort and reason, especially as the work in law amounts to nothing. This afternoon (and part of the morning) we read

William Lyon Mackenzie King in his early 20's.

through "As You Like It". Mother followed with intense earnestness and with the happy spirit of a little girl. I have never known a woman so pure in life and thought, so young in heart and so full of love as Mother.' (July 13, 1899).

It is unusual that King's Oedipal conflict with idealization of his mother and debasement of his father, arose in his early adulthood, rather than in childhood.

Not only did King's idealization of his mother allow him to repress his erotic attachment to her, but this idealization was transferred to all women of good family and most especially to women of the nursing profession. Any love or passion he felt for such women became a comment about their purity and their devotion to good works.

'...she looked very pretty and reminded me more than once of Longfellow's description of Evangeline in the church.' (Aug., 12, 1894).

'I saw Miss Fairfax *(a nurse)* as she came out of the hospital and her face was like that of a Madonna, pure and blessed, and I could feel its goodness.' (April 23, 1897).

'Helen looked beautiful with her hair hanging over her shoulders on a pink blouse. I could not help loving her.'

Despite this romantic idealization of some women, the young King was already very involved with prostitutes. The frequency with which King visited prostitutes should be mentioned. His trips were first documented with the second entry of his journal and averaged to about monthly visits. His jaunts were irregularly spaced; sometimes there were two calls in a week.

King had a personal vocabulary for his visits to prostitutes which reflect his consciousness of wrong-doing.

'The night was worse than wasted. Went about 8 pm and returned at 11:30 pm. All the intervening time worse than wasted.' (Oct. 9, 1893).

'I committed a sin *(probably a reference to masturbation)* today which reminded me of my weakness and so aroused me that I went over and had a long talk with Murray tonight.' (Oct. 26, 1893).

'I have done much wrong today and feel how very weak I am without my Savior to continually help me.' (Jan. 1, 1894).

'It was very hard for me to stay in. I felt I must go out and stroll around. Alas I have much to conquer as yet.' (Feb. 1, 1894).

'(I failed again last night.)' (March 2, 1894).

'I strolled up to St. Joseph St., met some person took h to ____ St. Came home much upset at heart.' (July 26, 1894).

'...got into another trap cost me $1 — wasted time till 5.' (Nov. 19, 1896).

'Oh fool that I am who will deliver me, — went completely to the devil with my passions, wasted money and came home sad.' (Oct. 30, 1897).

He was torn by the tremendous guilt associated with his behavior and often resolved to reform.

'I must reform. I am going to try to lead a better life, and trust I will be able to follow out this resolution.' (Oct. 22, 1893).

'I must be a better boy and make better use of my time.' (Nov. 22, 1893).

'I committed a sin today which I am going to pledge will never happen again.' (July 18, 1894).

'I must become a better christian. I am not at all satisfied with the hypocritical life I am leading.' (Nov. 23, 1895).

'Why am I so weak. Why cannot I keep where I strive so hard to be? — I will try harder the next time.'

Although his resolutions to try harder sound shallow and childish, King's guilts ranged from mild self-rebuke, shame or despondency to profound depression.

'I cried after coming home tonight. I feel very sorry for something I did last night.' (Feb. 2, 1894).

'I am ashamed to record all, I felt very sorry on coming home.' (April 6, 1894).

'I have lived a wretched week, felt discouraged, downhearted and indifferent.' (March 21, 1896).

'Have felt sad all day disappointed and depressed, have been beneath a cloud.' (Nov. 20, 1896).

'Oh God when will I be altogether a man and less a beast.' (Dec. 15, 1897).

'When the bells of the old year were sounding its knell I was upon my knees asking for forgiveness for the wrongs of the past. (Jan. 1, 1898).

Although King still toyed with the idea of becoming a minister throughout these years, he must have been aware that his immorality made him unsuitable. On the other hand, perhaps he thought that by joining the clergy, he would finally acquire the strength to resist temptation.

Devoutly religious, possessing a great interest in entering the Ministry and living in the Victorian era, King was crippled by guilt. This guilt cause him great mental anguish, leading to a depressive illness in the winter of 1896-7 with frequent episodes of bitter weeping. This theme of debilitating guilt is tremendously important in King's career for it led to his unrealistic attempts at rehabilitation of various prostitutes.

As a reaction formation *(i.e. the development of conscious attitudes and interests that are the opposites of certain unconscious or infantile trends)* to his frequenting of prostitutes, King developed a paternalistic attitude towards these women and set himself up as a savior and force for good in their rehabilitation.

'In the evening learned more of the great evils to be conquered in the city...We are all so apt to give way to temptation.' (Nov. 23, 1893).

'I believed firmly this girl would reform and had I been there all would have been well. I know in her heart she wants to see me and do what is right, but all the evil forces are working against her.'

King would seek out young harlots in their lodgings and engage them in exhortation and prayer. His vigorous attempts at saving these "fallen women" were usually frustratingly unsuccessful as depicted in the case of 'poor Mina Cameron'.

'Poor Mina wandered off today and went back to her place on King St. I went down after her and after playing Detective for a while I found she was in the room but she got out a back way before I could find her. I went down again, however, and got her, she came back with me.' (Feb. 15, 1894).

'I chanced to hear that Mina has again gone back to her old life...Poor Mina I cannot get her out of my mind. No one could describe my feelings tonight.' (Feb. 20, 1894).

'Then came home and went over to my little "mission field".. I was momentarily shocked to hear that poor Mina Cameron was in Mercer's Reformatory for stealing.' (June 5, 1894).

King's guilts and passions were not appeased by his personal "mission" work and thus, sublimation *(an unconscious defence mechanism in which unacceptable drives and wishes are modified into more personally and socially acceptable channels)* came to replace reaction formation as the major defence mechanism in the suppression of King's sexual drive and in guiding his future.

An element of rationalization *(defence mechanism through which irrational behavior, motives or feelings are made to appear reasonable)* is also expressed as King worked as police court reporter for the **Globe & Empire** during a year off from his studies 1894-95. He concluded that the hearings would help him as a Reform Economist.

'I am going to make a careful study of the poorer classes and the worst social evil *(prostitution)* with a view to remedying to some degree the latter and bettering the condition of the former.' (Nov. 29, 1894).

'I will find this a good plan to see the shadowy side of life, looking at everything from an economic standpoint.' (Nov. 5, 1895).

King became an admirer of the American social reformer, Jane Addams and his Settlement work at her Hull House for the destitute in Chicago, directed his social conscience towards practical ends. He lost interest in saving prostitutes and recognized the change in himself.

'I felt I was becoming less interested in the criminal classes and more interested in the working classes, and deserving

Portrait of King's mother, Isabel Grace Mackenzie King.

poor.' (July 30, 1898)

Unlike the true socialist, King always felt superior to the working people and saw himself as their savior and protector.

> 'I like the untutored working man, frank, rough and honest. He is true and there is no pretense or sham, but there is a middle class which I care for little!. There is enough intelligence to make ignorance inexcusable and obnoxious.' (November 20, 1898)

> 'My heart, my whole heart goes out to these people. Their lives are real.' (February 24, 1899)

Sublimation perfected! Free of his guilts and his self torturing sexual desires, King's visits to prosititutes diminished and eventually disappeared. He then established an international reputation after exposing the "sweat shops" of the clothing industry and became an expert in labor-management relations. Soonafter, he was made Minister of Labor, head of the Liberal Party and Prime Minister of Canada.

DISCUSSION:

It appears then that Mackenzie King was unusually close to his mother, a woman who maintained this closeness by denigrating his father and making him feel guilty when he became too closely associated with another woman.

> 'I received a letter from mother today, to which father *(this is the first small 'm' to appear in 'mother' and King did not rebestow the capital until after his engagement to Mathilde Grossert, the nurse in Chicago, was broken)* added a line. It was to come home and talk over everything first and a warning against too hasty a step.' (April 6, 1898)

> 'Tonight I received letters from home, one from mother which makes me sick at heart. She speaks of me forsaking her, she speaks of father's disappointment, she speaks as tho' all hope had been resting upon me and as though I had been selfish, forgetful and thought never of them all.' (April 7, 1898)

King's idealization of his mother and his praising of her physical beauty were naturally enough associated with the repression of any erotic fantasy about her. Unfortunately, this idealization and desexualization were also apparent in his relationships other women.

King split women into the pure and noble on the one hand and the debased and ignorant on the other and with only the latter was he able to express his sexual urges. This produced an intense guilt and although generally unable to stop "wasting" his time, as a reaction formation he put much energy into "saving" the prostitutes of Toronto and other cities in which he lived. This was unrewarding work as the girls seemed to prefer their nocturnal employment to the jobs in domestic service that were offered to them as an alternative. King, therfore, diverted his reforming zeal from prostitutes to those who were the victims of the "sweat shops". With this sublimation , he was better able to control his sexual urges and as his involvement in labour reform increased, his involvements with prostitutes were reduced.

Freud discusses this particular psychopathology in "A Special Type of Choice of Object Made by Man" (1910). He described certain neurotic men who consort with prostitutes and whose "Love-relationships with these women are carried on with the highest expen-

diture of mental energy". This is associated with a "precondition to the effect that a woman who is chaste and whose reputation is irreproachable never exercises an attraction that might raise her to the status of a love object."

Freud adds, "What is most startling of all to the observer in lovers of this type is the urge they show to "rescue" the woman they love." He explains this object-choice as derived from the infantile fixation of tender feelings on the mother in those in whom "the libido has remained attached to the mother for so long, even after the onset of puberty".

Pubescent awareness of the mother's sexuality, combined with the desire to think of her as pure, leads to the splitting of these aspects of the mother; the sexual to "prostitutes" and the purity to others. The need to rescue the prostitute is seen as an unconscious repayment to the mother for the "gift of life" which she has given through her sexuality.

REPRISE

This might well have been the end of the tale except that King's mother could not live forever. In 1917, when King was 42 years old, living a celibate and spiritual life and working on his magnum opus "Industry and Humanity", his mother became seriously ill. King refused, at first, to believe the doctor when he told him she was dying. He recounted how on her 74th birthday, short weeks before, he had kissed her '74 times and then a few extra times and was happy in the thought of how wonderful it was that she had lived at all'.

However, in the subsequent months, despite the fact that he was a public figure in Ottawa, he was driven at night to the arms of harlots. He felt guilty but returned to them often.

King became obsessed with the idea that on one of these self-indulgent occasions, his mother might die. He was, nevertheless, unable to stop the behaviour. He was, concomitantly, unable to work on his book and it appears as if the imminence of his mother's death caused a revision to the state of mind and type of behaviour that he had shown 20 years before.

King was then plunged into the federal election campaign of 1917 where he was the candidate for North York, the district once held by his maternal grandfather, William Lyon Mackenzie, one of Canada's famous rebels. Part of King's idealization of his mother may have resulted from his remarkable identification with her father, after whom he was named.

In the midst of the campaign on November 29, 1917, he was called back to Ottawa because his mother's condition was deteriorating. He stayed a few days and made funeral arrangements. It is doubtless significant that his diary entries ended during that trip on December 2. His mother died on December 18 and he did not resume his journal again until February 1, 1918. Once his mother had passed away, King was able to resume his previous productive activities and withdrew from his guiltridden trips into the night.

As a final footnote, it is important to appreciate that King was never able to accept his mother's death as a final reality. On one of his first diary entries after her death, he tells of a dream in which she comes to him and tells him she is still alive. She continued to return in his dreams to reassure him in times of stress. He also "contacted" her many times in his later years by means of a spiritualist medium.

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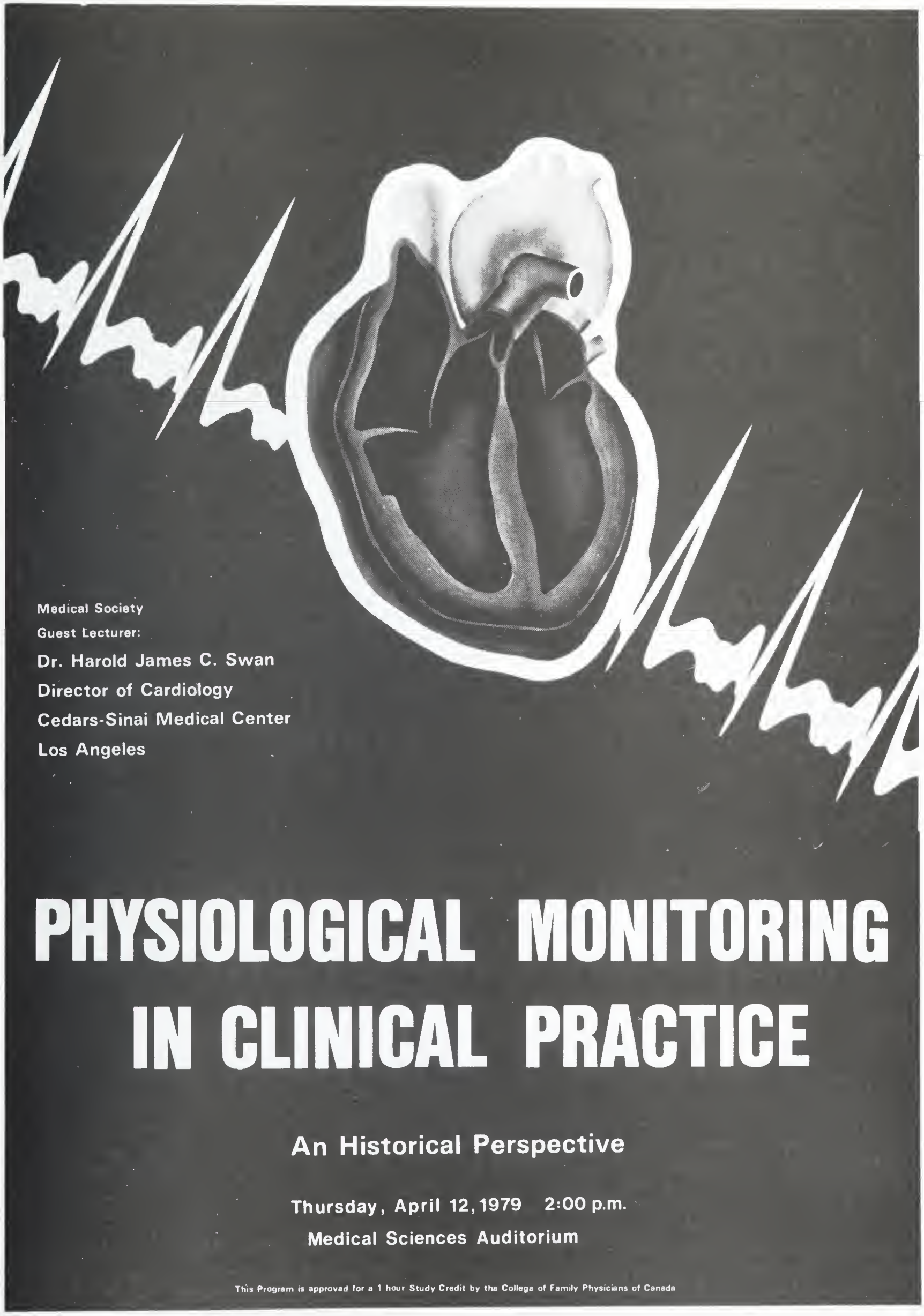
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Differential Diagnosis Of Stroke In The Elderly

Shehnaz Rhemtulla 8T0

Although there have been numerous studies done on the underdiagnosis of strokes, little has been documented concerning conditions that mimic them and are consequently diagnosed as strokes. Objectively assessing the clinical signs of stroke is difficult, more so in the aged in whom both the high incidence of cerebrovascular accidents and the greater prevalence of simulating conditions such as epilepsy, acute confusional states and drop attacks, favour misdiagnosis.

A retrospective study was carried out on the non-stroke patients admitted to the stroke unit of Sunnybrook Medical Centre by investigating their medical records. Particular attention was paid to the clinical features of these patients which led to the diagnosis of stroke on admission.

It was found that a large group among the misdiagnosed consisted of seizure patients. Confusional states due to various causes, tumours, old cerebrovascular accidents (CVA) and syncope accounted for the rest. (Table 2).

Method and Data

The study group consisted of all non-stroke patients, admitted to the stroke unit at Sunnybrook between January 1975 and December 1977, who were misdiagnosed as strokes on admission. This group excluded non-stroke patients admitted to the unit for bedspacing and monitoring purposes. Infarct, hemorrhages and transient ischemic attacks (TIA) were considered as 'true' strokes. 'Fringe strokes' ie. migraine, subarachnoid hemorrhage, subdural hemorrhage, ischemic encephalopathy, hypertensive encephalopathy and venous infarcts were considered as strokes for the purposes of this study.

A total of 952 patients were admitted to the unit within the 3 year span. 195 of these were non-stroke patients. Records of 168 were investigated (27 records were unavailable). Of the 168 non-stroke patients, 106 were found to be definitely misdiagnosed on admission, the rest (62 patients) being admitted for bed spacing and monitoring purposes.

The level of misdiagnosis was considered next. Since the typical patient admitted to the unit is seen by the emergency resident, the neurology resident and in some cases the pathologist, in that order, four levels of diagnosis were considered in order to determine the level at which the most misdiagnoses occurred, (Table 1).

The major group misdiagnosed as strokes (which consisted of patients

Level at which correctly diagnosed	# of patients	% of patients
Emergency Resident	5	5
Neurology Resident	32	30
Followup investigations and consultation	57	54
Pathologist	1*	1*
No definite diagnosis reached at discharge	11	10
Total	106	100%

*brain biopsy - glioblastoma

Table 1 - Level at which patient correctly diagnosed.

Condition	# of patients	%
seizure	35	33.0
confused state	15	14.0
tumors	9	8.5
old infarcts	8	7.5
syncope	7	7.0
not diagnosed	11	10.0
miscellaneous	21	20.0
Total	106	100%

Table 2 - Final discharge diagnosis of the non-stroke patients admitted to the stroke unit.

with seizure disorders) were further studied as to their state of consciousness on admission and the etiology of the seizures, (Tables 3 and 4). EEG patterns of this group were also studied. (Table 5).

Discussion

As in most conditions, history and physical examination play an important role in differentiating stroke from other mimicking conditions. In particular,

1) the temporal profile
2) the clinical setting and
3) presence of focal neurological deficits are useful in reaching a diagnosis.[1]

However, in this group, adequate histories were unavailable except in cases where a relative or bystander witnessed the episode. The patients were unable to give comprehensible histories on admission because of altered states of consciousness, senile dementia (a large proportion were over the age of 80) and acute confusional states. Cases where the episode was witnessed were few since most of the subjects either lived alone or were discovered after the event.

Although the neurology resident was more proficient at clinically reaching a diagnosis than was the emergency resident, the majority of patients were only diagnosed correctly after utilization of such diagnostic tools as the CAT scan, lumbar punctures, angiograms, brain scan and EEG (and in some cases, after consultation with the neurologist), (Table 1). Thus, diagnostic tools such as those mentioned above, are invaluable in reaching a diagnosis in equivocal cases.

On classifying the misdiagnosed according to the discharge diagnosis, a third consisted of patients with seizure disorders, (Table 2). Those with confusional states consisted of patients suffering from senile dementia, acute confusional states, drug overdose, anxiety and delirium tremens. The miscellaneous group consisted of cases of vestibular neuronitis, Meniere's disease, benign positional vertigo, peripheral vascular disease, radial nerve palsy, pneumonia, meningoencephalitis, cardiovascular diseases (congestive heart failure, myocardial infarction, pacemaker failure), Herpes Zoster, osteoarthritis, hypoglycemic episodes, transient global amnesia, flu with headache, multiple sclerosis, hepatic encephalopathy and systemic lupus erythematosus. In each of the above cases, misdiagnosis of stroke occurred despite an appropriate history available on admission.

It is of interest to note that seizure patients accounted for ⅓ of the misdiagnosed. This finding may not appear to be very surprising since it is known that focal post-ictal states such as Todd's paralysis may be mistaken for stroke.[2] However, among this seizure group of 35, only 6 or 17% had post-ictal Todd's paralysis on admission, (Table 3a). This raises the question as to why the rest of the seizure patients were misdiagnosed as strokes.

Investigating the seizure group further, it was found that 18/35 or 51% had altered states of conciousness on admission. These patients ranged from drowsy to comatose, (Table 3b). These altered states of consciousness may have followed grand mal seizures. Nine or 26% had residual neurological deficits from an old CVA, features which mimic signs of an acute cerebrovascular insult. In fact, post-CVA gliosis was a major cause of the seizures, (Table 4).

Another factor which causes seizures to be mistaken for strokes is the similarity between the former and TIA's[3]. In this study, 7/35 or 20% of the seizure patients were diagnosed as TIA on admission. Although these two entities may appear similar due to the temporary occurrence of neurologic deficits, documenting the evolution of the deficits may be help-

State of conciousness	# of patients	%
alert	16	46
drowsy	10	28
stuperous	2	6
comatose	6	7
unknown	1	3
Total	35	100%

Table 3a - Mode of presentation of the seizure patients on admission.

Presentation	# of patients	%
post-ictal Todds paralysis	6	17
altered state of conciousness	18	51
residual neurological deficits - old infarcts	9	26
others	2	61
Total	35	100%

Table 3b - The states of conciousness of the seizure patients on admission.

Presumed etiology of seizures	# 0f patients	%
post - CVA gliosis	13	37
cerebral degeneration (senile dementia, Alzheimers)	6	17
post surgical - SDH evacuation	3	8.5
alcoholic withdrawal	2	6
A-V malformation	1	3
unknown	10	28.5
Total	35	100%

Table 4 - Presumed etiology of the seizures in the seizure patients' group.

EEG pattern	# of patients	%
focal slow	13	43
focal spike	2	
generalized slow	6	26
generalized spike	3	
normal	10	29
EEG not done	1	3
Total	35	101%

Table 5 - EEG pattern of the seizure patients.

ful in differentiating them. Whereas TIA's manifest simultaneous involvement of the whole of an involved territory, focal epilepsy tends to spread from one segment to another of a limb. Also, TIA's are manifested by transient weakness of a limb, while Jacksonian epilepsy involves clonic movments which gradually spread to other regions of the body.[4] These salient features of differentiation are likely to be missed if the episode is not witnessed by trained medical personnel. Thus, patients with repeat seizures in hospital are more likely to be diagnosed accurately. In fact, repeat seizures occurred in 54% of the seizure group and confirmed the diagnosis.

When repeat seizures are not witnessed in hospital, reaching a definite diagnosis of epilepsy without a past history of this disorder can be difficult. This is more so in the elderly in whom seizures may occur without any obvious underlying cause except, perhaps, cerebral atrophy (which may not be evident on scans or EEG). In this study, spike activity was seen only in the EEG's of 5 patients (14%) indicating epileptogenic foci, while 70% showed focal or generalized slow waves, patterns which are non-specific, (Table 5). Thus, a combination of various criteria such as reliable history of the episode from a reliable witness, past history of seizures, alcohol ingestion, repeat seizuring in hospital, EEG pattern and evidence of brain atrophy on CAT scan were used to reach a final diagnosis of seizures.

Summary and Conclusion

Seizures may pose as CVA in many ways. In this study, ⅓ of the misdiagnosed strokes were epileptics. The rest consisted of confusional states, syncope and tumor patients.

The importance of accurate diagnosis in these conditions cannot be over-emphasized. The misdiagnosis of stroke and subsequent admission of a patient to a stroke unit can be costly in terms of both inappropriate allocation of hospital beds and in the delayed management of the true underlying disorder.□

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Pneumocystis Carinii Pneumonia (PCP)

Fei-Fei Liu 8T0
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G. Kutas M.D.

Ms. K.P., a 48 year old female, was admitted to Women's College Hospital on 4/5/77 because of fever, shortness of breath, and a productive cough of two weeks' duration.

In 1972, she underwent a modified mastectomy for a right-sided breast carcinoma. In 1974, she had another simple mastectomy on the left side for another primary breast carcinoma. At that time, metastases were found in her pelvic bones and spines. A bilateral oophorectomy was also performed. From August '74 - August '75, she was treated at regular intervals with triple therapy consisting of Cyclophosphamide, Methotrexate, and Prednisone. Since then, she has been maintained on Cyclophosphamide 100 mg/day and Prednisone 10 mg/day.

She had been feeling relatively well until two weeks prior to admission when she noticed shortness of breath on exertion, a fever which spiked to more than 38.0 C as well as cough, productive of a white, tenacious sputum. There were no chills, nor rigors, nor hemoptysis, and no chest pain.

On physical examination, she appeared ill and fatigued. Respiratory rate was 20/min. and regular. Breath sounds were normal with occasional dry rales. JVP was not distended. The apex was palpable at 5th intercostal space and mid-clavicular line. There was a Grade I/VI Systolic ejection murmur over the left sternal border. The liver was palpable 2 cm below the costal margin, but with a normal span. The tip of the spleen was palpable at the costal margin.

Her Hb was 10.8gm%;Hct was 31%; wbc was 8600 with a normal differential; platelet count was 220,000/mm^3. Urine microscopy and culture were negative. Sputum was negative for cytology and acid fast bacillus but it grew *C. albicans*. Chest X-ray revealed a diffuse bilateral pneumonitis. An open biopsy of the left lingular tip was carried out on 11/5/77. Pathology revealed *P. carinii* organisms.

She was started on trimethoprim-sulfamethoxazole (TMP-SMX) 4 tabs TID per os. Her course in the hospital is charted on the accompanying graph. There was subjective improvement in her shortness of breath shortly thereafter. Her fever started to decline on 21/5, and returned to normal on 25/5. As can be noted, her A-a gradient also started to decrease after commencement of the TMP-SMX therapy.

The first report of chest X-ray (CXR) improvement occurred on 30/5, and slowly progressed till complete clearance by Nov. 1977. She developed oral candidiasis 12 days after initiation of TMP-SMX therapy, but it was successfully treated with Mycostatin mouthwash 100,000 Units QID. After a 19-day course of TMP-SMX, she was discharged on 3/6/77.

She remained well until 15 months later, when she was admitted to Women's College Hospital on 14/8/78 complaining of increasing shortness of breath, a low grade fever and a productive cough of one week's duration.

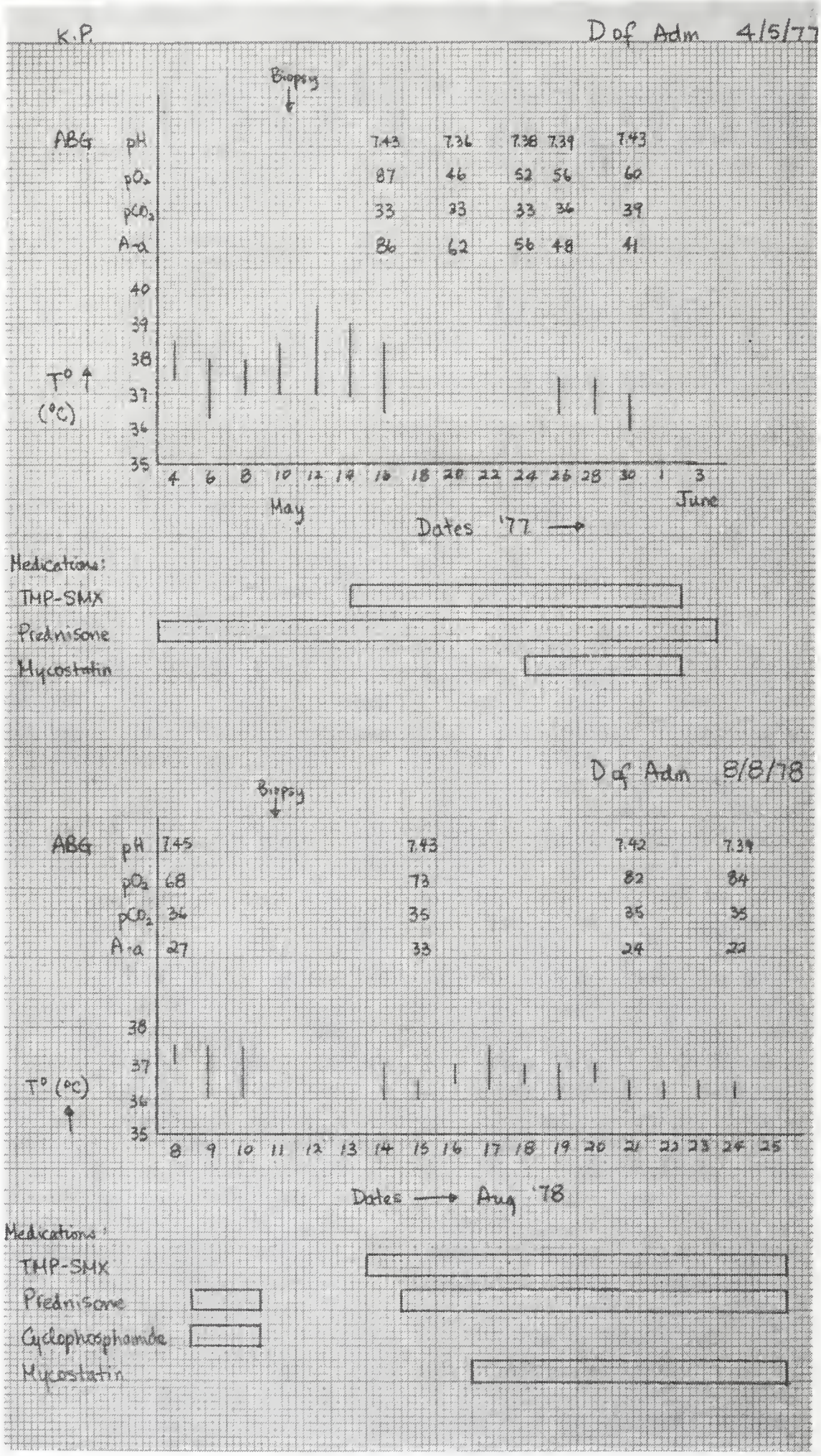
There was a Grade III dyspnea with shortness of breath on one flight of stairs. The cough was again productive of a white tenacious sputum. However, the maximum temperature recorded was only 37.8 C. There was again no hemoptysis and no chest pain. Her maintenance medication for the past 15 months had been/ Prednisone 10 mg/day, and Cyclophosphamide 100 mg/day.

There was no sign of cyanosis. Respiratory rate was 20/min. Air entry was equal bilaterally. There were rales heard in both bases. CXR demonstrated a diffuse bilateral interstitial-alveolar infiltrate. An open lung biopsy was performed on 11/8/78 from the left lower lobe; the diagnosis of Pneumocystis Carinii Pneumonia (PCP) was established.

She was started on a 12-day course of TMP-SMX 4 tabs TID PO (see accompanying graph). Oral candidiasis again developed after 3 days of therapy, but was successfully controlled by Mycostatin mouthwash. She was discharged on 26/8/78 with Prednisone 10 mg/day and TMP-SMX 2 tabs BID PO.

Epidemiology

PCP is a rare opportunistic infection; its incidence in the general population is 0.3 cases/10^6/year[1]. Its incidence in children with malignancies is 4.1%/yr.[2] It attacks



These two graphs document K.P.'s course in the hospital for both admissions. Daily maximum and minimum temperatures are recorded. Data for 4/5/77 admission is recorded every other day while data for 8/8/78 admission is recorded daily.

all age groups, with no sex or racial preferences. The taxonomy of the *P. carinii* organism is still a matter of controversy. Most people consider it to be a protozoa, but due to its staining characteristics, some think it resembles a fungus. The organism has never been cultured, and the disease is reproduced with difficulty in animal models only if they are first cortisone-suppressed. The carriage rate of *P. carinii* organisms has been reported to be as high as 40%[3], therefore, PCP in the compromised host is considered to be an activation of a latent infestation, rather than due to an exogenous infection.

PCP occurs primarily in 6 clinical settings:

i) debilitated or premature infants
ii) patients with malignant diseases on immunosuppressive therapy
iii) patients with collagen-vascular diseases on immunosuppressive therapy
iv) patients undergoing organ transplants on immunosuppressive therapy
v) patients with a primary immunological disorder
vi) patients with an acquired immunological disorder

In K.P.'s case, she has a malignant disease - disseminated breast carcinoma being maintained on an immunosuppressive regimen.

Presenting Signs & Symptoms

K.P. Had been maintained on Cyclophosphamide and Prednisone for two years when she presented on 5/4/77 with shortness of breath on exertion (SOBOE), spiking temperature, and a productive cough. Physical findings were unremarkable except for fever, tachypnea and occasional dry rales.

This is a fairly typical presentation for PCP, characterized by fever, shortness of breath (SOB), cough and minimal physical findings. The classical PCP CXR is a bilateral perihilar and basilar infiltrate that progresses to diffuse alveolar consolidation within 3-4 days.[4] When presented with such a patient, there should be a high index of suspicion of PCP. The most definitive method of diagnosis of PCP is established by an open lung biopsy.

Therapy

Once a diagnosis of PCP is made, therapy should be started immediately. Two drugs are available for the therapy of PCP:

I) Pentamidine isethionate, which is a dihydrofolate reductase inhibitor[5], and

II) Trimethoprim-sulfamethoxazole (TMP-SMX). TMP inhibits the microbial dihydrofolate reductase, which reduces dihydrofolic acid to tetrahydrofolic acid. SMX competitively inhibits the incorporation of para-aminobenzoic acid.

According to a study by W.T. Hughes, et al[6], pentamidine isethionate and TMP-SMX have been shown to be equally efficacious in the therapy of PCP, but TMP-SMX has the advantage of having far fewer adverse side-effects. The conventional regimen of TMP-SMX for therapy of PCP is: 20 mg/kg/day of TMP and 100 mg/kg/day of SMX usually treated for 14 days.

The response to therapy can be monitored by 3 factors:

i) defervescence

ii) arterial blood gases(ABG)

iii) chest X-ray

Defervescence is the most sensitive and rapid indicator of response, followed by ABG which usually returns to normal within a few weeks. CXR starts to improve early in the course of therapy, but complete resolution is not achieved until a few months later. The most frequent adverse side-effect of TMP-SMX at such dosages is oral candidiasis. But this problem is usually solved successfully by either Mycostatin mouthwash or suppositories.

Prognosis

Without therapy, PCP is almost 100% fatal; but even with aggressive therapy, the best results with children are only around 75%[6]. The cure rate in adults is probably far less.

K.P.'s case is interesting in that she had a recurrence of PCP 15 months later. According to Hughes' experience, PCP recurred in 14% of his patients previously treated with pentamidine isethionate[6]. In these recurrent cases, one would like to speculate that this is a relapse from the *P. carinii* organisms that survived the first bout of anti-PCP therapy.

The presenting clinical signs and symptoms of the second bout were much milder than that of the first bout, with less SOB, cough, and only a low grade fever. The duration of illness was very short; she was treated for only 12 days. She was discharged on Prednisone 10 mg PO OD, and TMP-SMX 2 tabs PO BID. Hughes showed successful chemoprophylaxis for PCP in high risk patients by giving 150 mg/m²/day of TMP and 750 mg/m²/day of SMX in 2 equally divided doses at 12 hour intervals.[7] With a history of recurrent PCP, there is no doubt that K.P. is a high risk candidate for PCP. Therefore, she was placed on this TMP-SMX prophylactic regimen and has thus far remained PCP-free.

Conclusion

Pneumocystis Carinii Pneumonia (PCP) is a rare, but important infection that attacks the compromised host. Therefore, it should be seriously considered as a likely diagnosis in any immunosuppressed patient presenting with SOB, fever, and a cough with few physical findings. Chest X-ray usually presents as a diffuse bilateral infiltrate. The only reliable method of diagnosis is made by an open lung biopsy. Once the diagnosis is made, the patient should be started immediately on either pentamidine isethionate or trimethoprim-sulfamethoxazole.□

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Cardiac Rhythm Monitoring Using A Microcomputer

John Doyle M.A.Sc., 8T2

The use of the electrocardiogram (ECG) in cardiac rhythm analysis is well-known and is used routinely in clinical practice. Usually, several minutes of the ECG (often lead II) are displayed on tape and are visually analyzed to detect such rhythm disturbances as skipped beats or premature ventricular contractions.[1] However, where continuous cardiac rhythm monitoring is desired, continuous visual analysis of the ECG is impractical.

In response to this need, considerable time and effort has been expended to develop computer-based systems of ECG analysis for both diagnostic and patient monitoring purposes. For example, ambulatory ECGs can be recorded using a miniature tape recorder carried by a patient for periods over 24 hours and the resulting tapes can be later analyzed by computer for various kinds of arrhythmias.[2]

For patient monitoring applications, however, instant (on-line) analysis is necessay, and machines for this purpose also exist.[3] Most computer systems for ECG analysis

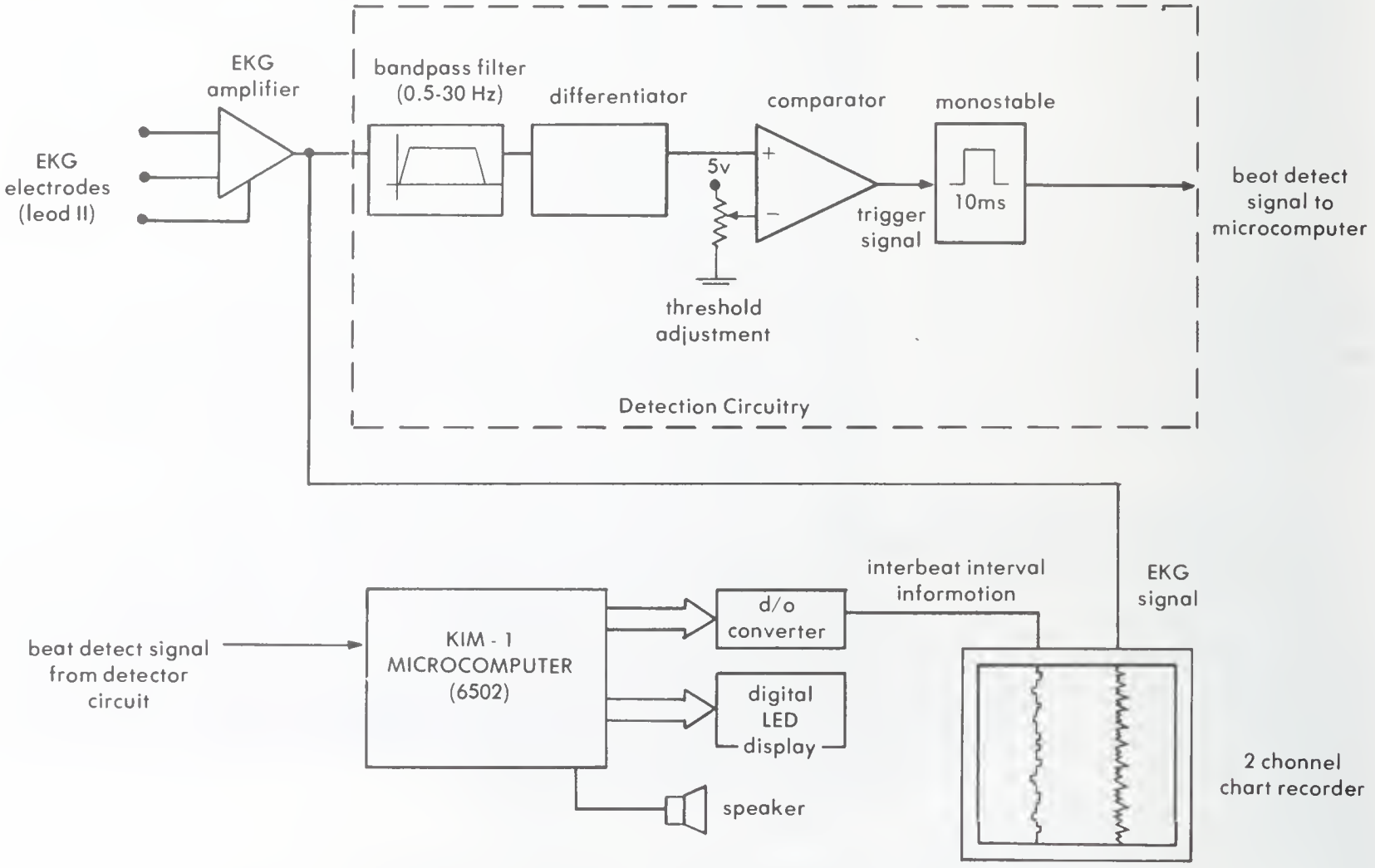

Fig. 1 - Block diagram of the cardiac rhythm analysis system developed by the author.

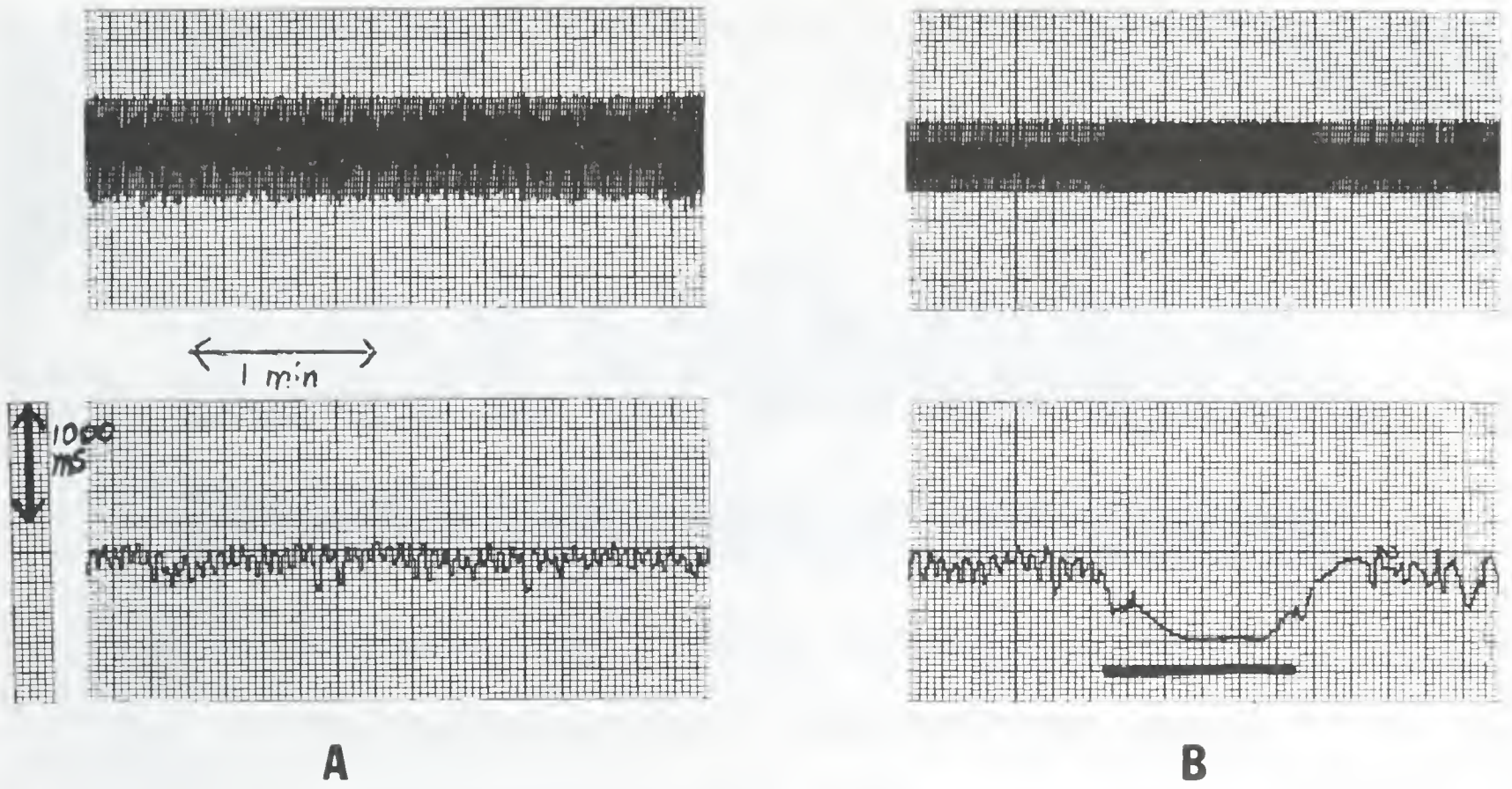

Fig. 2 - Recordings from the author.
(a) Note the variations in the interbeat interval in the lower tracing (sinus arrythmia). Subject is at rest.
(b) Response to hyperventilation (dark line). Note the decrease in the sinus arrythmia and the increase in rate (decrease in interbeat interval).

cost in excess of $10,000.

Description of System

This paper describes a low-cost microcomputer-based system developed by the author for on-line cardiac rhythm monitoring using the ECG. The cost of the system exclusive of the chart recorder is under $1,000. Figure 1 shows a block diagram of the system. The system basically consists of two units — an electronic circuit which detects the rising R wave of the ECG — and the microcomputer which determines the interval between the R waves and outputs this information to a chart recorder. The detection of the R wave is accomplished by electronically computing the derivative (rate of change) of the ECG and signalling the computer that the heartbeat has occurred once the derivative exceeds an adjustable threshold level. (The alternative of a simple ECG voltage threshold circuit was rejected because of problems with wandering baselines in the ECG.)

The microcomputer used for the system was a KIM-1 single-board microcomputer using the popular 6502 microprocessor. The computer

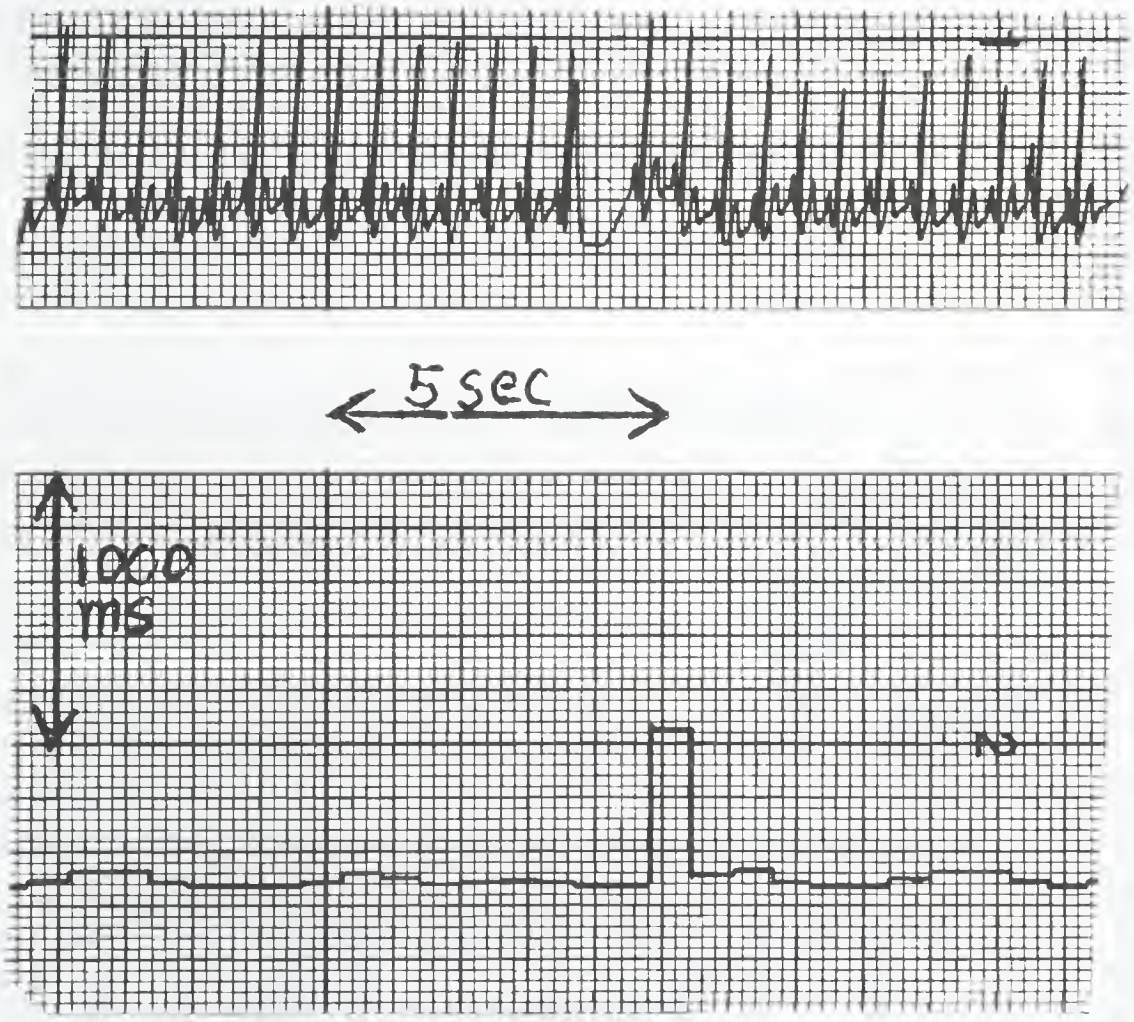

Fig. 3 - Premature ventricular contraction (PVC). Note the system's response (lower trace) to the PVC in the upper trace. Chart speed has been increased to permit PVC visualization.

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has a light emitting diode (LED) display which is used to display the interbeat interval in milliseconds on a beat by beat basis. A digital-analog converter is used to output to the chart recorder the same information in graphic form. A speaker sounds a "beep" whenever a beat is detected.

Results

Figure 2 shows the results for an experiment using the system. The author is the subject. The top tracing is the ECG, while the bottom tracing indicates the interbeat interval. Two things can be seen in this figure. First, in Figure 2a, the normal sinus arrhythmia is evident as a variation in the lower tracing. Secondly, when the heart rate increases (as with hyperventilation in Figure 2b) this arrhythmia decreases.

Results similar to those shown in Figure 2b are obtained for exercise studies, but movement artifacts present problems for reliable beat detection during exercise. This scheme is, however, useful for analysis of recovery from a standardized exercise task.

Figure 3 shows how the system can be used to recognize a premature ventricular contraction (PVC). The PVC has a smaller derivative (smaller slope) than a regular heartbeat, and thus does not trigger the R wave detector in the system. When the next regular beat occurs, the system "thinks" that the interbeat has doubled, and puts out a correspondingly larger pulse. This permits PVC recognition without visual examination of ECG morphology. (The author is indebted to Professor O'Beirne of the Institute of Biomedical Engineering for supplying this latter data on tape.)

Future Work

Future plans include efforts to recognize cardiac arrest and sound an alarm when an arrest occurs. The system could also be programmed to sound another alarm when the PVC rate exceeds, for example, 6 per minute. One could even consider the automatic injection of an anti-arrhythmic drug such as lidocaine upon detection of a serious arrhythmia. This latter idea would require a computer-controlled syringe, but would probably save lives by providing an immediate response to life-threatening arrhythmias. □

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Outcome Of Fractured Hips In The Elderly

Richard J. Friedman 8T0

Fractures of the proximal end of the femur occur most commonly in elderly people.[1] They are associated with a high morbidity and mortality not because of the leg injury itself, but because of the physical and mental consequences of a period of relative immobility. This study examines how well these patients do in terms of survival, ambulation and quality of life.

In the past, active treatment used to be delayed 3-4 weeks because it was felt that attempts to surgically repair the fracture would prove fatal. However, the patients frequently died within 10 to 14 days of cardiac, pulmonary or renal complications precipitated by bed rest.

It is now recognized that surgery within the first few days after injury is important to permit mobilization. The goals of surgery are:

1) to decrease morbidity and mortality

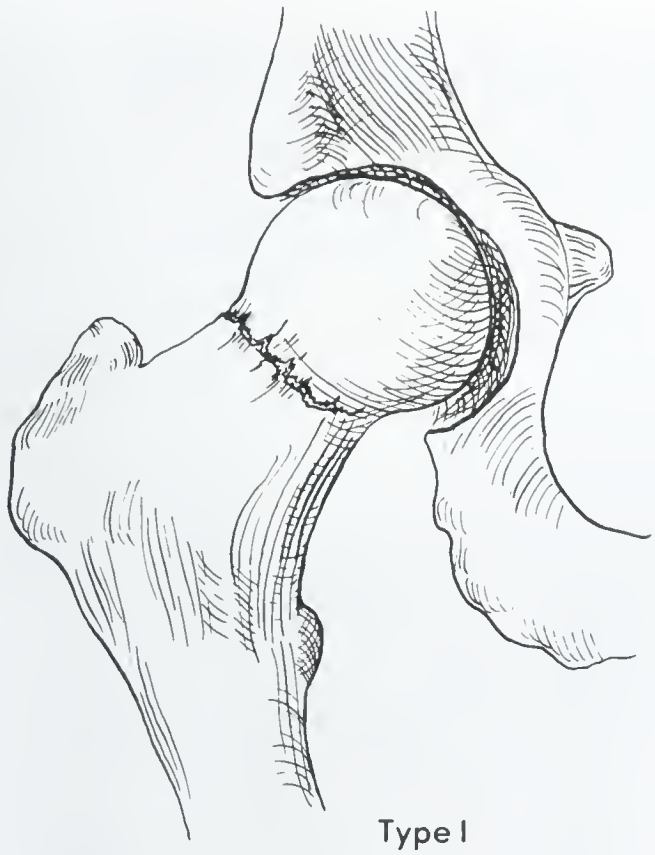
2) to return the patient to ambulatory status quickly

3) to achieve union of the fracture in a functional position.

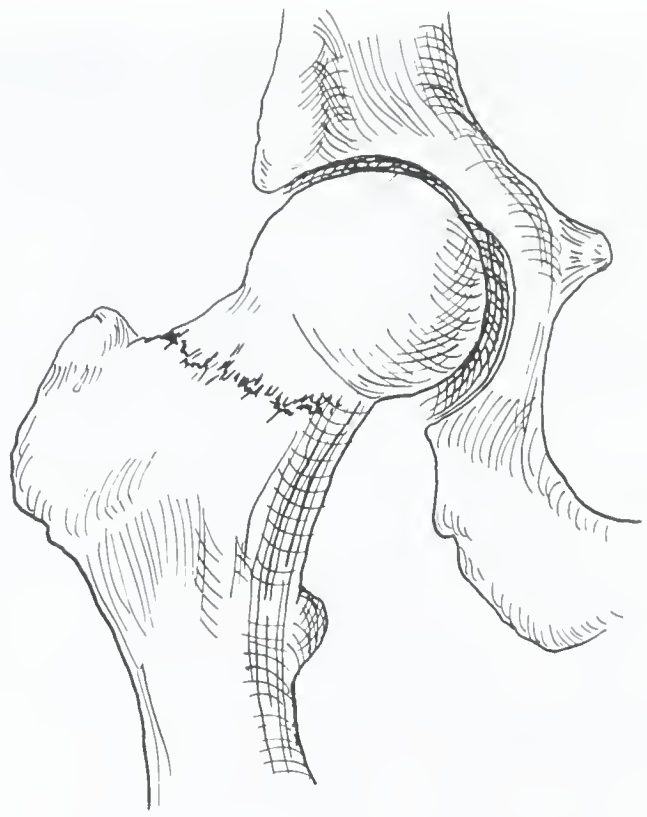
Fractured hips can be classified into two groups: intracapsular and extracapsular. Intracapsular fractures (Fig. 1) occur in the femoral neck proximal to the capsular insertion. Garden's classification[2] according to displacement and comminution is useful in determining the prognosis, since displaced fractures have a higher rate of non-union and avascular necrosis: Type I-incomplete fractures; Type II-complete without displacement; Type III-partially displaced; Type IV-complete displacement (Fig. 2). Types I and II can also be impacted.

Extracapsular fractures occur from the base of the neck where the capsule inserts to two inches below the lesser trochanter. This includes intertrochanteric and subtrochanteric fractures (Fig. 3).

Fig. 1 - X-ray of intracapsular fracture.



Type I



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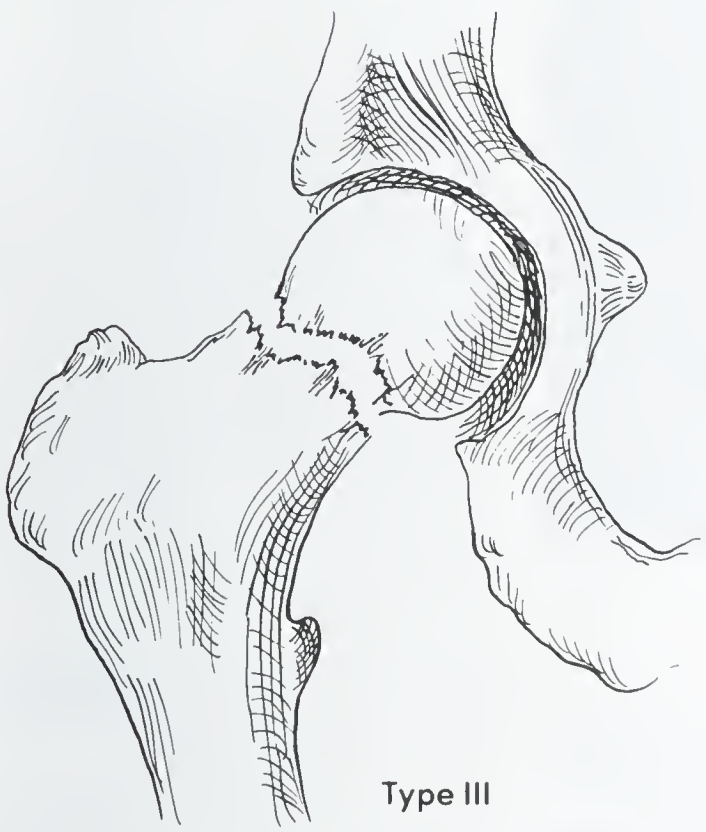

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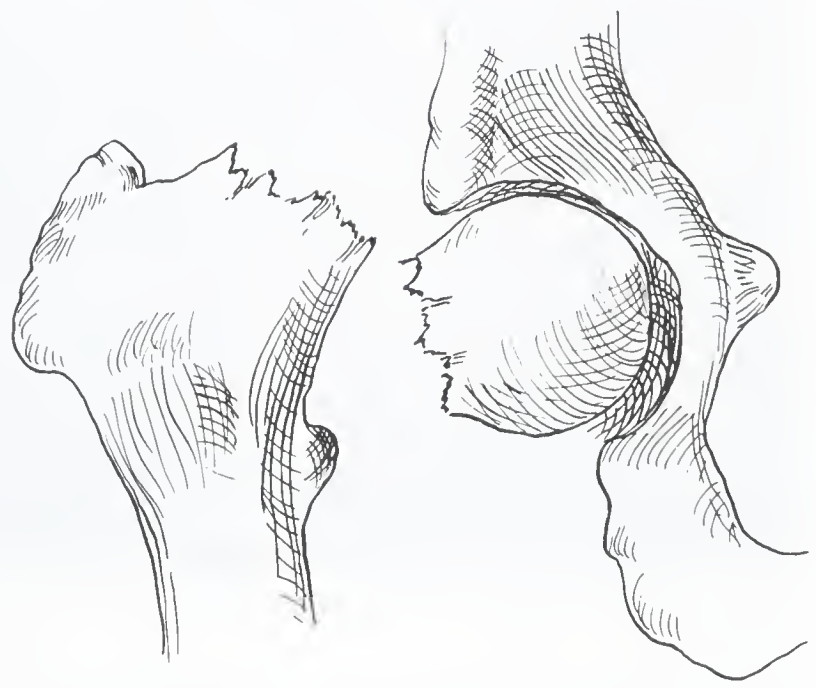

Type IV

Fig. 2 - Garden's Classification of Intracapsular Fractures.

There is often a history of a fall following which the patients is unable to bear weight. On physical examination the leg is shortened, lies in external rotation, and movement is painful. The impacted intracapsular fracture may be stable enough to allow weight bearing and pain free movement, but without treatment there is a high risk of disimpaction of the fragments.

Anteroposterior and lateral radiographs are important not only to confirm the diagnosis, but also because the level of the fracture influences the method of surgical treatment.

Two general approaches to surgical repair of intracapsular fractures exist: internal fixation or prosthetic replacement. With internal fixation, the fracture is first reduced by applying traction, abduction and internal rotation, and then fixed in a

Fig. 3 - X-ray of intertrochanteric fracture.

reduced position using nails, pins, plates, etc. Many types of hardware are available, the choice being the surgeon's.

Prosthetic replacement of the femoral head and part of the neck, when indicated, overcomes the problems of non-union and avascular necrosis (Fig. 4). The morbidity and mortality is greater than with internal fixation, and infection can be disastrous, necessitating removal of the implant and leaving the patient with a flail joint.

The blood supply to the femoral head and neck is from:
1) lateral epiphyseal arteries from the posterolateral retinacular (capsular) vessels.
2) inferior metaphyseal arteries from the posteromedial retinacular vessels.
3) ligamentum teres vessels from the obturator artery.

Intracapsular fractures have a risk of vascular insufficiency leading the avascular necrosis. In displaced intracapsular fractures, prosthetic replacement avoids this complication and allows immediate weight bearing. However, this procedure has a higher morbidity and mortality.[1] With undisplaced or impacted intracapsular fractures, internal fixation is the treatment of choice because these have a lower risk of avascular necrosis. Between these two extremes, the choice depends on the fracture pattern, the surgeon's preference, and the patient's general health.

For extracapsular fractures, repair is by internal fixation, frequently with a Richard's pin and plate (Fig. 5). More recently Ender's nails, a form of intramedullary fixation, are being used. This procedure avoids a wide surgical incision and reduces the risk of infection, but has yet to gain wide acceptance.

Post-operative care involves early ambulation, thus avoiding the complications of immobility. Union of the fracture is well established in 3-4 months, and the incidence of non-union at this time is less than 5%.[3] Avascular necrosis, a late complication of intracapsular fractures, occurs anytime from 6 months to 10 years (average 3 years) later at a rate between 15-35%. Infection is more serious after prosthetic replacement because removal of the prosthesis is necessary, leading to a loss of a functional hip joint.

Method

From July 15, 1977 to July 14, 1978, all patients admitted to Mount Sinai Hospital with a fractured hip were entered into the study, the only exception being pathological fractures. The patient, the family or nursing home staff were interviewed at this time and again in 6 months.

The difference between the observed survival in the patients and the expected survival in the general population gives a direct measure of the contribution of the injury to mortality. Based on past studies[3], it was decided that by 6 months the patients' and general population's mortality rates should be identical.

The quality of life was determined with eight specific questions and then scoring the number of "yes" answers on a scale of 1-5 (8 "yes" answers = 5; 6-7 = 4; 4-5 = 3; 2-3 = 2; 0-1 = 1). Comparisons were made preoperatively and at 6 months.

Sixty-five patients with 66 fractures were originally entered into the study. Five died before discharge from the hospital, and 2 were lost to follow-up. Twelve people died before the end of the 6 month period, thus leaving a total of 46 patients.

Fig. 4 - X-ray of Moores prosthesis.

Fig. 5 - X-ray of Richard's Pin and Plate.

Females outnumbered males 4:1, agreeing with other studies.[4 5 6] This is thought to be due to 2 factors — senile osteoporosis, and more females are alive after age 60 due to longer life expectancies.[3] The average female age was 79.6 years (range 43-98) and for males 79.2 (54-89). Eighty-five percent were operated on within 24 hours of admission. Average hospital stay was 22 days.

Results

Most of the accidents were reported to have occurred at the patient's place of residence, that being a nursing home for half. One patient was hit by a car, one fainted and fell, and the rest sustained their injury in a fall while conscious.

All questions asked concerning the quality of life showed a decrease in what the patients were able to do at 6 months (Table 1). The score obtained was 2.9 before the injury and 2.3 at 6 months ($p < .01$).

Five patients died in hospital (Fig 6), two from pulmonary emboli, the others three from bronchopneumonia, congestive heart failure and a cerebrovascular accident. Of the 58 patients discharged, 31 were alive and ambulatory (walker, crutches, cane or independent), 15 were alive and non-ambulatory, and 12 had died at 6 months. Of these 12, 9

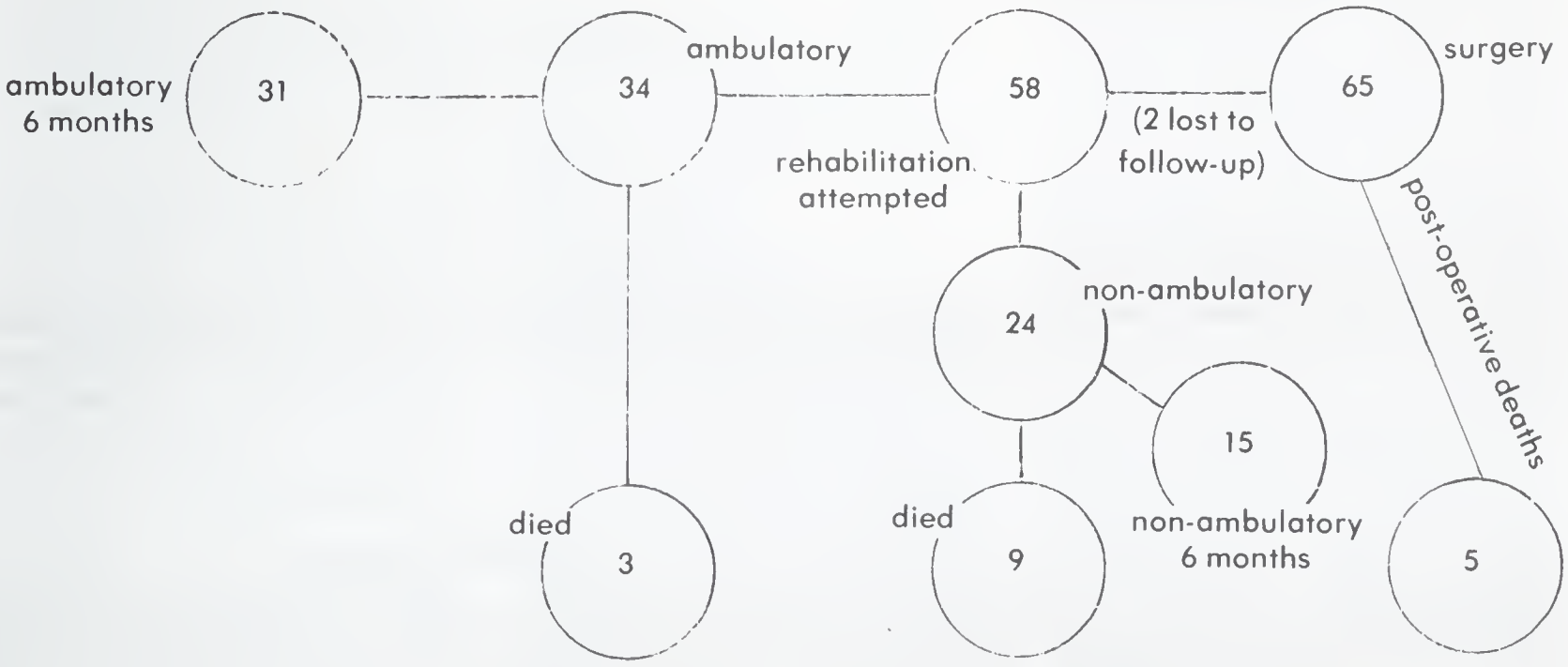

Fig. 6 - Flow Chart Showing Course and Outcome of Patients at 6 Months.

Question	Percentage Answering Yes: Prior to Injury	6-Months	Change
1) Did patient feed him/herself?	85%	67%	-18%
2) Did patient dress him/herself?	64	44	-20
3) Did patient attend to personal hygiene by him/herself?	59	32	-27
4) Did patient do own shopping?	30	19	-11
5) Did patient do own housework?	35	19	-16
6) Was patient employed full or part-time?	9	7	-2
7) Did patient engage in recreational activities?	50	35	-15
8) Did patient have social contacts?	97	93	-4

Table 1 - Quality of Life

never achieved ambulatory status. The mortality rate of the group that did not achieve ambulation was 38%, compared to 9% in the group that did ambulate ($p \leq .01$).

The probability of death and becoming non-ambulatory appears to increase with age (Table 2). The percentage of non-ambulatory patients rises from 25-35% and the death rate doubles from 15-30% in the patients aged 70-79 compared to 80-89. These trends do not hold for over age 90, but this may be due to the small samples ($p \leq .05$). Excluding those who died, 96% of the patients were ambulating before their injury, compared to only 67% at 6 months ($P \leq .01$).

The percentage survival curve (Fig. 7) was calculated based on the death rate/month, and compared to the expected death rates for the general population, approximately 4.4% can be expected to be dead at 6 months, compared with 27% in the fractured hip population. The mortality was highest in the first four months, then leveled off and approached the same rate as the general population, as exhibited by the almost parallel slopes.

The male death rate was 46% vs 22% for females ($.05 < p \leq .1$). With this equivocal result, one cannot say if men have a higher risk of death. Greater numbers would be needed to determine this.

The extracapsular: intracapsular ratio is 1.04:1 (Table 4). Intracapsular fracture repairs were split between internal fixation and a prosthetic implant, while all but one extracapsular fracture had internal fixation.

Accompanying medical diseases that had been recorded upon admission or in a pre-operative medical consultation include dementia (44%), heart disease (40%), cerebrovascular disease (20%), hypertension (19%), diabetes (19%), and carcinoma (11%). Post-operative complications seen (not including perioperative death causes) were urinary tract infections (8), anemia (5), deep vein thrombosis (3), pulmonary emboli (2) and decubitus ulcers (2).

Discussion

There is an increasing susceptibility to unguarded falls in the elderly[8]. Even if the forces are light, protective reflexes are slowed, and with osteoporosis, the danger of a fracture rises.

The quality of life, as determined in this study, is significantly less following "recovery" from a fractured hip. As a result, these patients are unable to function as before, often requiring assistance with their daily activities, either from friends and family or chronic care institutions. This can be most distressing to the patient. There probably is no single explanation for the reduction in the quality of life.

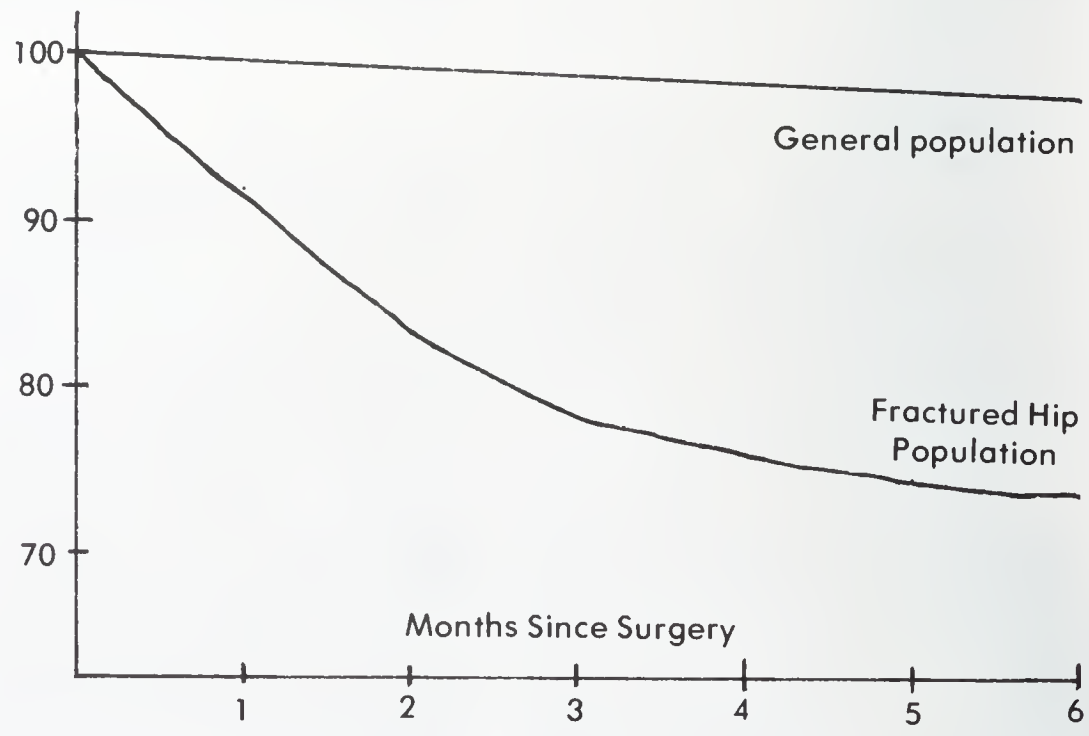

Fig. 7 - Survival After Hip Fractures.

Table 2 - Outcome of Patients at 6 Months

Age	# of patients	Outcome% Ambulatory	Non-ambulatory	Dead
< 70	7	86%	0%	14%
70-79	20	60	25	15
80-89	23	35	35	30
90 +	8	63	25	12
Total	58	53%	26%	21%

Table 3 - Mortality Rates for the General Population and Fractured Hip Group.

	Total	% died	Expected death rate in 6 months	P value	Average age at death
Males	13	46%	5.7%	P<.01	80.5
Females	50	23%	4.0%	P<.01	85.7
Total	63	27%	4.4%	P<.01	83.9

Table 4 - Fracture Classification and Treatment

Type of Fracture	% of total	Prosthesis	Internal Fixation
subcapital	49% (32)	18	14
intertrochanteric	45% (30)	1	29
subtrochanteric	6% (4)	--	4

The observed mortality rate of 27% in this study at 6 months in contrast to 4.4% in the general population compares favourably with rates in other reports.[5 6 9] When relating this increased mortality solely to the injury and treatment, one assumes that the fractured hip group is a representative sample of a large population, and that other diseases in this group occur with the same frequency as in the general population. However, the study is biased with half the patients coming from nursing homes. This fact may be partially responsible for the increased mortality. It is also obvious from this study, that in order to assess the true mortality rate of this fracture, follow-up must be for 6 months.

Previous studies have shown that there is a higher mortality rate and incidence of non-ambulation following hip fractures in patients of advanced age.[4 5 6 9] Thus age is an important prognostic indicator of recovery and survival. While this study was not able to show an increased risk of mortality among men, others have.[5 6]

The higher mortality seen in non-ambulatory patients is to be expected, but the magnitude is larger than previously reported.[5] It is this group that is responsible for the high mortality rate, and must be looked upon as another prognostic indicator of recovery and survival.

Even when a patient is confined to a bed or wheelchair, they too benefit from surgical repair in order to relieve pain and make the nursing care easier and more effective. Lyon and Nevins[10] believe that non-operative management is a reasonable alternative in patients who are unlikely to walk again, but further studies are needed to determine the viability of this alternative to surgical repair.

Conclusion

The following factors were found to be associated with an increased risk of mortality in patients with fractured hips:

1) advanced age.
2) non-ambulation.
3) possibly male sex.

The quality of the patient's life, once "recovered", is less than before the injury, and fewer patients are ambulatory. At 6 months, 27% of the patients had died, compared to an expected 4.4%. Patients who survive for 6 months can be considered "recovered" because their survival rate is close to that of the general population. It is obvious from this study that fractures of the hip in the elderly have profound medical and sociological consequences. □

The author would like to thank Dr. Allan E. Gross for continued guidance and support during the course of this study.

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Community Health Centres In Ontario

Update On Alexandra Park Community Health Centre

Doug Sinclair 8T0

Better health care at a saving — the dual goals of the Community Health Centre

In 1973, the Health Services Organization (HSO) program, which includes the operation of Community Health Centres was launched by the Special Programs branch of the Ministry of Health of Ontario. At that time, there were two sources for the push for this innovation. Community groups in underserviced areas were pressuring the government for the establishment of Community Health Centres. As well, various commissions in Manitoba, Saskatchewan and Quebec had shown that community health centres could save money for the health care system.

Dr. John Aldis headed a group within the Ministry to assist persons or groups who wished to establish Health Service Organizations, (which will be called Community Health Centres throughout this article) in their communities.

The interest was high. By 1975, thirty community health centres were established in the province. Sixty others had either submitted briefs or were preparing them for the Ministry of Health.

In March 1975, the new health minister, Frank Miller, announced a freeze on the funding of new health centres. This freeze seemed to be due to pressure from the OMA, financial restraint within the ministry, and a general insecurity surrounding the whole community health centre program within the Ministry of Health.

Political Action

Since that time, the Ministry of Health has not been able to decide what to do with Community Health Centres. *The Hastings Report* and *The Spitzer Report* provide sound reasons both medical and economic, in favour of the establishment of more comprehensive health centres. The New Democratic Party paper "Health, Not Illness" shows that some politicians, at least in theory, have recognized the importance of the Community Health Centre.

In theory, Community Health Centres should cost more than traditional primary care centres, but they should reduce the cost of secondary and tertiary care by reducing hospital admissions and providing preventive care. Of course, the government would like to prove this claim. *The Spitzer Report* states that this sort of evaluation will only be valid when the number of centres is at least fifty. At present, there are still only thirty in Ontario. Despite this, the government of Ontario is forging ahead with a clumsy evaluation program which is growing to be a frustrating annoyance to both the staff and the Boards of the centres. In the past year, budgets have been frozen, and the centres have no clear idea of funding patterns for the future.

As these economic and political events unfolded, people at the various centres realized that some form of political action had to be taken. In 1977, the Community Health Centres in Metro Toronto formed an informal working group which, in March 1978, presented a brief to the Minister of Health oulining mny of the aforementioned issues.

In August of 1978, the Metro group formed a formal association to act as a voice for Community Health Centres, to share information and services between centres, and to act as a political body to negotiate with Ministry of Health on health issues.

In September of 1978, members from all Community Health Centres in Ontario met at the University of Toronto. Plans are now underway for an increasing liason and the sharing of information between health centres.

The Community Health Centre

In the midst of all this political activity lie the fundamental questions of what exactly is a Community Health Centre? What responsibilities does it have? Who should operate it? The variations in answer to these questions among the health centres in Ontario is tremendous. Many of them have only the name in common.

To complicate matters even further, the Community Health Centre is a trendy concept. Its approach to medicine is "holistic" and "patient-centred"! The staff is "non-judgmental", "laid back" and operate

under the "team approach". The real meaning of these terms is ill-defined and very confusing.

The Community Health Centre is **not** a glorified doctor's office with a physician on salary. It is more than a group practice. It is not a place where Boards of Directors play power games with patients records and staff holiday pay.

A Community Health Centre is organized within a community to provide health care to that community. The centre should be operated by a board of directors of community members who make policy and budgetary decisions, which are then carried out by professional staff.

The staff must complement each other in skills and approach. A family physician must be able to co-ordinate care with other health professions, understand the methods for implementation of preventive medicine and have an understanding of family functioning, as well as being competent in general medicine. The nurse practitioner fits ideally into this system. She/he is responsible for immunization follow-up, well-baby and well-woman exams, and home visits. The social worker has an important role in more intensive counselling and family therapy.

House calls are essential to the operation of the health centre. They give the staff an opportunity to assess family functioning and the level of child care and nutrition. Home visits are essential to the care of the elderly population. Close association with a pharmacist, or a pharmacy on site, is important to monitor drug prescriptions and avoid polypharmacy. This is a tremendous problem in urban areas.

Preventive Medicine

The most important area for the Community Health Centre is that of preventive medicine. The budgetary structure of the health centre is organized to encourage this practice. The health centre receives a global budget based on the "roster" of the centre. This roster is a list of "members" of the health centre. These "members" receive their primary care at the centre.

In theory, if the rostered members were kept healthy by the efforts of the health care staff, then the work load would be reduced. The incentive is to keep people healthy, rather than performing multiple "services" with a fee attached to each one.

Preventive medicine at a Community Health Centre is not only advising individuals to stop smoking or to lose weight, but in addition involves initiating or co-ordinating classes in nutritional, alcohol and weight-control counselling. It means dealing with public health nurses who follow up high risk families and intervene before psychiatric crises occur. It means aggressive family planning and birth control programs, especially for people who are afraid to go to the doctor.

Preventive medicine means health education to explain medical procedures and the causes of potential illness. It is important to explain to a woman the principles of hygiene that will prevent recurrent urinary tract infections instead of writing yet another prescription for Septra. The Community Health Centre should be innovative in mental health by teaching people how to understand and cope with life crises, emotional upsets and the stress of urban living.

Alexandra Park Community Health Centre

If the Community Health Centre is such an important innovation, how can students become involved in these political, emotional and economic issues? The answer, of course, is by active participation in this exciting process. The Alexandra Park Community Health Clinic, (also called SHOUT) founded ten years ago by a group of University of Toronto students, attempts to put into practice this model of health care.

The centre is located near Spadina Ave. and Queen St. in downtown Toronto on the periphery of the Alexandra Park Ontario Housing Project and down the street from a senior citizen's apartment. The present operation includes a family practice unity with two physicians and a nurse practitioner, a pharmacy and a dental clinic. The centre is open five days and four nights a week with twenty-four hour on call service.

Students from the faculties of medicine, dentistry, nursing and pharmacy do electives at the centre. Students from the faculty of Occupational and Physical Therapy run programs in nearby schools. This is one of the few opportunities the undergraduate has to learn something about the other health professions, people he or she will magically be expected to work with on graduation.

In many ways, Alexandra Park has not fulfilled its mandate as a Community Health Centre. This can be blamed on many factors including the student and staff turnover and economic uncertainty. However, 1978 was a very exciting year at the centre. The Board of Directors made up mostly of students, encouraged community members to become more actively involved. This has led to closer contact with the Tenants' Association at the Housing Project and the development of joint health education programs. Goals and objectives have been set up for the centre and in 1979 the objective of following up immunization records is almost complete.

The Board has defined the position of Medical Director who has the responsibility for the implementation of new programs and the evaluation of present services in monthly reports. Hypnosis therapy is expanding at the centre and an instructional course will be offered to students. A social worker, specializing in family therapy has been helping staff to upgrade their counselling skills.

The next leap will be into occupational health. A summer project will work with health and safety committees at local industries to assist them in assessment of occupational disease.

This growth and excitement is not confined to Alexandra Park Community Health Centre. Other centres in Metro Toronto are forging ahead with new programs, instead of waiting for the Ministry of Health to make up its mind.

Perhaps, if this energy keeps building, the axe will not fall, and the Community Health Centre will show Ontario how to be healthy. □

Ethics And The Medical Curriculum

Jeff Sloan 8T0

Ethics is defined as the science of morality.[1] Medical ethics, it would seem, is therefore a science which deals with moral issues in the health sciences. Defined in this way, one cannot deny that medical "etiquette" (which deals with intraprofessional matters) and medical jurisprudence (dealing with external constraints with which the physician is obliged to comply) come within the domain of medical ethics. However, the scope of medical ethics is much broader than these confines and is growing continuously. To many people the mention of medical ethics brings to mind the familiar issues of abortion and euthanasia, and the well-known Karen Anne Quinlan case. Others may recall the recently publicized position paper of the Canadian Psychiatric Association regarding the withholding of treatment with specific reference to the approach taken by doctors at Toronto's Hospital for Sick Children in managing Down's symdrome infants born with bowel obstructions.[2] However, the average physician who deals daily with problems of informed consent, birth control, truth telling and the allocation of limited medical resources, knows that problems in medical ethics go far beyond the issues which are covered on the front page of the local newspaper.

Ethical problems have increased greatly in complexity and number in the last two decades or so due to the introduction of powerful, new diagnostic and therapeutic tools and techniques which are becoming more readily available to the average physician and are altering the entire practice of medicine as they do so.

The physician of the late twentieth century finds himself in a better informed and increasingly pluralistic society within which he is called upon to reconcile his own personal values and needs with the often conflicting needs of his patient and those of society as a whole. There is no reason to expect any major change in these trends in the near future, as Tiberius, in his excellent paper, points out.[3]

The far-reaching implications of many of these developments of the last couple of decades has sparked an enormous amount of public interest in ethics in the health sciences. This interest has not left our educational institutions untouched and has understandably been a cause of concern amongst medical educators and has resulted in the devlelopment of ethics curricula in many medical schools on this continent and elsewhere. It has been said that "the design of medical ethics curricula remains in an experimental phase"[4] and a quick review of the literature[5 6 7 8 9] confirms the validity of this statement. What has been the nature of the attempts to introduce the study of ethics into medical curricula and how have they been received?

One of the most favoured approaches to the "teaching" of ethics has been the informal seminar format where "experts" in various areas are invited to share some of their insights with small groups of students. This approach allows for freedom in the presentations and facilitates lively discussions.

Siegler makes an excellent case for bedside instruction in ethics in the tradition of William Osler. This, in fact, is probably one of the principle methods by which ethical wisdom has been imparted to medical students in the past, but it is not without its pitfalls as Siegler points out. One problem which he identifies is the lack of formal background of students and clinicians alike in philosophy and ethics. Another is reluctance to deal with ethics on the part of physician-teachers.[4] I have witnessed both of these problems in my own clinical teaching, and I suspect that this has been the experience of most of my colleagues.

One way to correct the problem of weak backgrounds in philosophy and ethical theory would be to offer to both students and clinicians a series of lectures or even a full course prepared by philosopher-ethicists. In fact, such courses already exist in most universities offering degrees in liberal arts, but their availability and appropriateness to a medical students resources and interests may be lacking.

Another concept which seems to be gaining popularity is the idea of ethical "rounds" where clerks, interns and residents meet with more senior clinicians on a regular basis to discuss ethical problems which arise on the wards. Such an approach has its value in its close approximation to "on-the-job training" and as such is the most likely of these approaches to capture the interest of the students involved.

The preceding constitutes a capsulized review of some of the methods now employed in presenting a medical ethics course. Veatch

and Gaylin provide a more comprehensive look at methods of teaching in their paper. The same paper describes medical students at Columbia University as being almost unanimous in their feeling for a need for the study of medical ethics within their school. The courses offered to them were generally received very favourably.[10]

It was in the light of this heightened interest in the inclusion of medical ethics courses within the curricula of medical schools of the late 1970's that a survey was recently conducted in an attempt to assess what is happening with ethics in Ontario's five medical schools. The results are summarized in Table I and Table II.

It is immediately apparent that a great deal of variety in the level of interest and approaches used is found within the province. At a glance, Queen's appears to be in the lead, with Western a distant second, while the remaining three schools have much less ambitious programmes. This impression may be deceptive, however. For instance, McMaster appears to have no program at all. Anyone familiar with McMaster's basic approach to teaching knows that teaching via courses in the traditional sense goes against their philosophy and ethics teaching is integrated into the problem-solving method of teaching employed there.

Data on course content was incomplete, but Western, Queen's and Toronto combine ethical and moral theory, bioethical issues, and bioethical problem-solving in their programmes.

Further analysis reveals that the majority of courses are of short duration—most less than 20 hours; Queen's seems to be more ambitious in offering two courses of considerably longer duration. All schools (excepting McMaster) have, or in the case of Toronto, plan to offer at least some kind of ethical educational experience of a mandatory nature. Elective programs exist at Queen's, Toronto, and Western with great variation in student participation (from one student to 100%).

Personal Views and Concluding Remarks

Now that you have had an opportunity to develop a feeling for the scope of medical ethics and ways in which it is taught while examining the current situation in Ontario, I would like to offer some personal comments concerning the function and role of ethics in the medical curriculum and raise some concerns that may have to be considered.

Obviously generations of physicians have been trained without having had the benefit of a specific ethical component to their education. Some might argue that need for such a component has not yet been demonstrated and that ethics is naturally integrated into the teaching of medicine and learned in this way. I strongly suspect, however, that the traditional methods of instruction in ethics i.e. "osmosos" and self-motivated study are no longer adequate to meet the needs of a changing physician in a changing society.

This brings us to the question of what we expect the teaching of medical ethics to accomplish in the medical curriculum—a very legitimate question. Perhaps we can begin by suggesting what such teaching should not be expected to produce.

As Clouser suggests, we should not expect a "Merck's Manual of Ethics" nor an ethical consultant who could generate rapid solutions to ethical dilemmas. He also maintains that we should not expect inclusion of ethics in the medical curriculum to motivate future physicians to be moral.[11] Tiberius even goes so far as to suggest that knowledge by itself could be used "in maintaining their authority and advantage over patients"! Ideally, as he says, "what is needed instead is a permeation of ethical behaviour and attitudes throughout a medical student's education, from the tiniest mouse sacrificed in a second year laboratory experiment to the nature and quality of the doctor-patient relationship which the student will observe as a clerk and intern".[3]

Barring this, however, formal program in ethics would hopefully use a formal which would promote and encourage the development of a consistent, satisfying and personal system of ethics by each individual student. This might be done by providing a forum in which students would be introduced to ethical concepts, encouraging both introspection and challenging of the precepts and positions of others in a congenial atmosphere facilitating a friendly exchange of ideas. This would equip the future physician to approach and work through both familiar ethical dilemmas in practice, as well as novel, unanticipated situations in a way that would allow him to live comfortably with the decision once made.

In order to realize these goals, I submit that this ethics programme would require all of the following characteristics:

a) *relevance*: it would have to be adapted to interests and problems unique to the medical sphere;
b) *interdisciplinary input:* Faculties of law, philosophy and theology, among others, would be expected to bring valuable insights and healthy perspective into this programme, and their participation in this kind of venture should be actively encouraged. Another consideration would be the modification and co-ordination of courses already in existence in these faculties to make them both appealing and available to medical students.
c) *appropriateness to the academic level of the student*
d) *flexibility*: sufficient flexibility would have to be built into this programme to allow adjustments changing needs and issues to take place as the changes occur.

Finally we must consider whether this proposed programme of ethics is to be of a mandatory of elective nature. Given the magnitude of the problems faced by even the average physician to-day, the anticipated continued growth of medical technology, and the inconsistency with which instruction in ethics is provided for otherwise, I would move that mandatory courses be implemented in all medical schools where they do not yet exist, with continual re-evaluation and updating of those programmes already underway. Within the medical curriculum, achievement of ethical competence would, of course, have to take second place to the achievement of technical skill and competence, but the practice of good medicine requires mastery of both. □

Du Temps Perdu

A.M. Summers 8T2

Although Hippocrates (460-379 B.C.) has been called the 'Father of Medicine', a number of civilizations with amazingly sophisticated medical knowledge had begun thousands of years before his time. It is, of course, impossible to discuss each civilization in detail in anything less than a magnum opus, so I have elected to isolate a number of facts about the ancients which have surprised me, and to present them in somewhat of a Ripley's 'Believe it or Not' fashion.

Probably the least surprising fact about the ancient civilizations were their extensive pharmacopeiae. Many of the more familiar drugs, e.g. chinchona, opium, cocaine, ephedrine, caffeine and digitalis have been handed down from various cultures throughout the ages. Five thousand years ago, the Chinese emperor Shen Nung published a book on herbalism, probably the first such work. He had apparently done a lot of the research himself — having reportedly taken up to 70 poisons a day (probably not the type of research that would be funded by the MRC today).

More interesting to me were the surgical techniques known to ancient and primitive man. Paleopathologists have found examples of trepanation in skulls from the European neolithic period (7,000-10,000 years ago). The patients apparently survived these operations as bony scar tissue has been found in association with the holes. Although the procedure was probably performed for the somewhat dubious religious reason of removing evil spirits, the fact remains that in at least some cases, it was a successful operation. More recently, the Egyptians (c. 2000 B.C.), although not considered to be very good surgeons on the whole — mummies have been found with fractures overlapping as much as two inches — were considered highly skilled in ophthalmology and dentistry. The Egyptian opthalmologists were famous throughout the ancient world for their skill — it is thought that they may have even been able to remove cataracts.

The most skilled surgeons of the ancient world were the Hindus (800 B.C.-1000 A.D.). They had over one hundred instruments, of which, the hand was considered the most important. These surgeons were able to perform highly technical operations including the surgical relief of neuralgia by sectioning of the infraorbital nerve, laparotomy and the suture of intestines which had become occluded or had been otherwise damaged. However, the procedures for which the Hindus were most renowned, and which are still used today, were in the field of plastic surgery. The Indian surgeons also had a rather interesting method of suturing — they pinched the edges of the wound together with the heads of termites, using the jaws as clamps.

The primitive civilizations were also surprisingly advanced in surgical procedures. When the Spaniards invaded Mexico, they found that in some ways the Aztecs were ahead of them. The Aztecs were able to suture with hair, and perform abortions and other operations. They also knew of 1200 medicinal plants including many narcotics, and the botanical garden of the king probably served as a model for the zoological gardens of European rulers.[1]

The physicians of the Peruvian pre-Incan civilization were skilled in trepanation, amputation and removal of tumours. Also, interestingly enough, they used a method of suturing similar to that of the Hindus — using ants instead of termites.

As far as diagnostics and therapeutics were concerned, several civilizations were very far advanced. The Chinese use of pulse diagnosis (theoretically, each organ has its own pulse) in conjunction with acupuncture has been used for thousands of years. The Egyptian *Edwin Smith* papyrus contains 48 case histories, carefully documented with a high level of clinical observation. The *Ebers* papyrus describes diseases which can now be identified as rheumatism, schistosomiasis, and diabetes. This papyrus also contains 876 prescriptions.

The Hindus believed in using all of their senses in diagnosis, including the sense of taste for testing sweet diabetic urine. The centre of their therapeutics was diet, but they also used emetics, cathartics, venesection and leeches — if none of these worked, they had a huge pharmacopeia.

Most of the ancient civilizations stressed hygiene and health very highly. The Egyptians took daily

baths and abstained from foods they considered unclean. The Hindus recommended brushing teeth, combing, exercise, massage, bathing, eating properly, resting, not sleeping in the daytime, and not eating fly-infested food.[2] Many African cultures bathed daily, brushed their teeth with sticks and kept their heads clear of vermin. The Peruvians had bathing establishments and sewage systems, and also had an annual health ceremony. The Babylonians (c. 2000 B.C.) also emphasized cleanliness and hygiene — they had sewage systems and toilets.

Epidemiology was much more highly developed in the ancient and primitive civilizations than it has been in Europe almost up to the present century. The Egyptians were aware that the annual flooding of the Nile brought disease. The Babylonians knew of contagion and consequently, isolated their lepers. The Hindus were aware that rats preceded plagues and the ancient Buddhist writings links mosquitos with malaria. The Indians also knew how to treat smallpox i.e. by inoculation, thousands of years before the Europeans discovered the method via the Turks.

Of all of the civilizations that I have mentioned, I find the pre-Incan civilization the most interesting because they managed to establish a semi-welfare state (a benevolent tyranny) two thousand years ago. There was provision made for upkeep and employment of the aged and crippled. Alcoholism and drug addiction were fought. Also, in a less benevolent vein, cripples were restricted from marriage.[3]

I suppose that one should not forget the medicolegal aspect of ancient medicine as this is still of major concern to most doctors. The first written law against malpractice was contained in the Babylonian Hammurabi's Code (2250 B.C.) which was actually the setting down of the Sumerian laws from a thousand years before. The law went as follows:

> *'If the doctor shall treat a gentleman and shall open an abcess with the knife and shall preserve the eye of the patient, he shall receive ten shekels of silver. If the patient is a slave, his master shall pay two shekels of silver. If the doctor shall open an abcess with a blunt knife and shall kill the patient or shall destroy the sight of the eye, his hand shall be cut off.'*[4]

Unfortunately, doctors couldn't obtain insurance at the time. Incidentally, if the slave died, he was merely replaced at the physician's expense.

Finally, I would like to mention the rather interesting approach of the Babylonians to the practice of medicine,

> *'In the opinion of Herodotus, the ancient Babylonians showed great wisdom in their treatment of the sick, for they had no physicians, but if anyone was ill he was put out into the public square, and etiquette demanded that every passer-by should ask him to describe his symptoms. If the stranger had heard of a similar case, or had himself had the disease, he was expected to give advice as to treatment.'*[5]

I don't know what happened to all of the Babylonian physicians between Hammurabi's Code and Herodotus — maybe they decided that it wasn't worth it. This system is attractive in that it would save the taxpayer a great deal of money — of course, the legal problems over payment of fees would probably cost more money than would be saved. □

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Ethics Curricula in Ontario Medical Schools

Table I - Mandatory couses 1978-1979

University	# of courses	Course Length (hrs.)	Format[1]
Queen's	2	25-30	D
		4-4	A
McMaster	--	--	--
Ottawa	1	10[2]	A
Toronto	1[3]	4	B
Western	1	19	D

Table II - Elective Courses 1978-1979

University	# of course	Course Length (hrs.)	Format[1]
Queen's	1	75	B
Mcmaster	--	--	--
Ottawa	--	--	--
Toronto	2		B
		12[2]	B
Western	1	14	D

[1] A-formal lectures
B-small group discussion or seminar
D-combination of A & B

[2] Only one hour of this course is devoted specifically to medical ethics.

[3] This course is to be introduced in 1979-1980 and will be only partially devoted to ethics.

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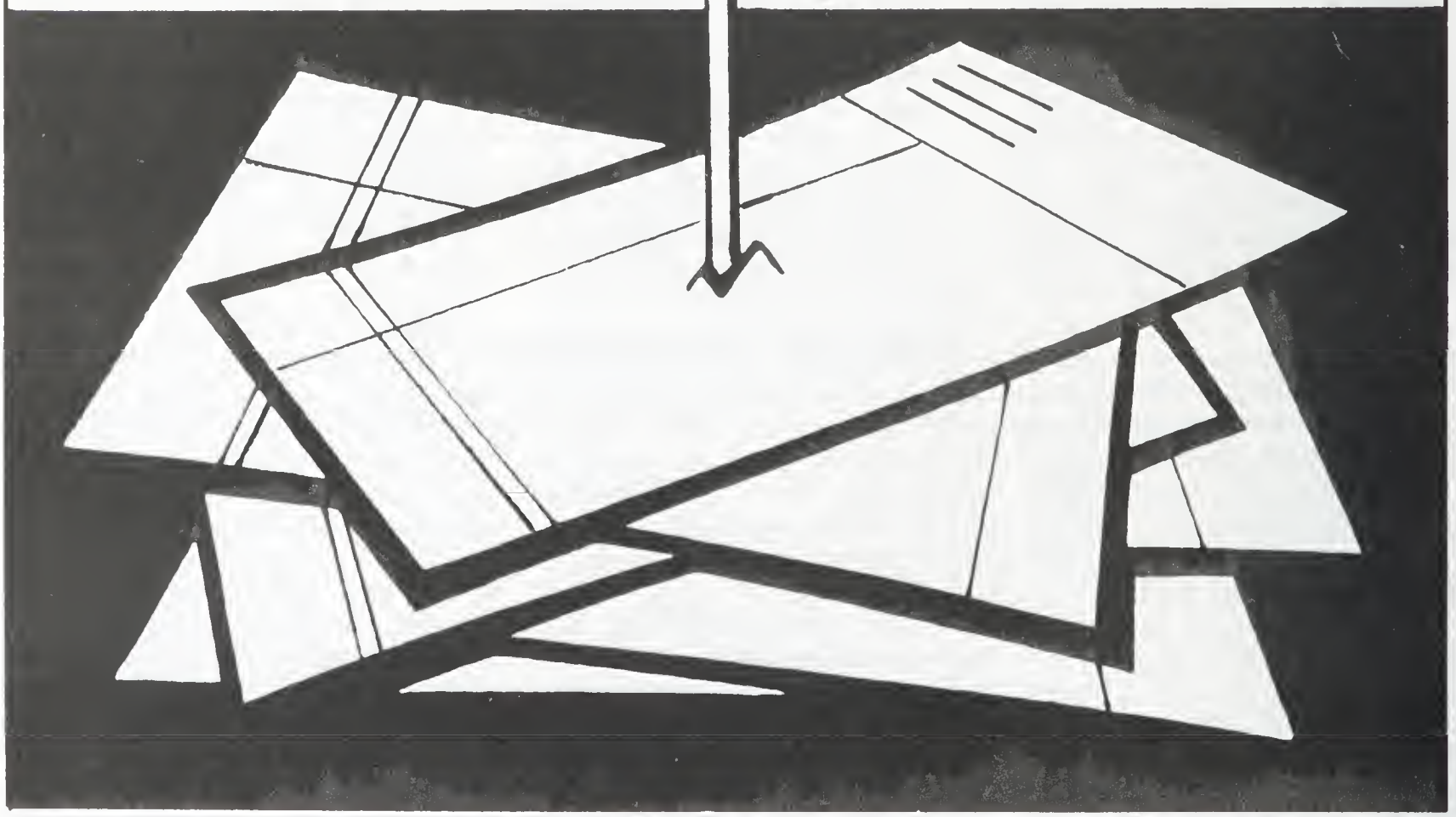

Thumbs Up:

Conservative Treatment of Acute Gamekeeper's Thumb

Nimrod K. Koifman 8T1

Gamekeeper's Thumb is an injury of the ulnar collateral ligament of the metacarpophalangeal joint of the thumb. This injury commonly results from ski falls. Since an intact ulnar collateral ligament is essential for stability of pinch, Gamekeeper's Thumb must be treated. There are two types of treatment available — open surgical repair or conservative immobilization in a cast. This article presents an assessment of the conservative treatment of a series of 26 patients.

Normal Anatomy of the MCP Joint of the Thumb

The MCP joint of the thumb is a multi-axial, diarthrodial joint capable of flexion, extension, adduction, abduction and circumduction. The ulnar collateral ligament of this joint is a strong, rounded cord, which is attached to the posterior tubercle and adjacent depression on the side of the head of the metacarpal bone. This cord passes distally and anteriorly to reach the ulnar side of the base of the proximal phalanx (Fig. 1).

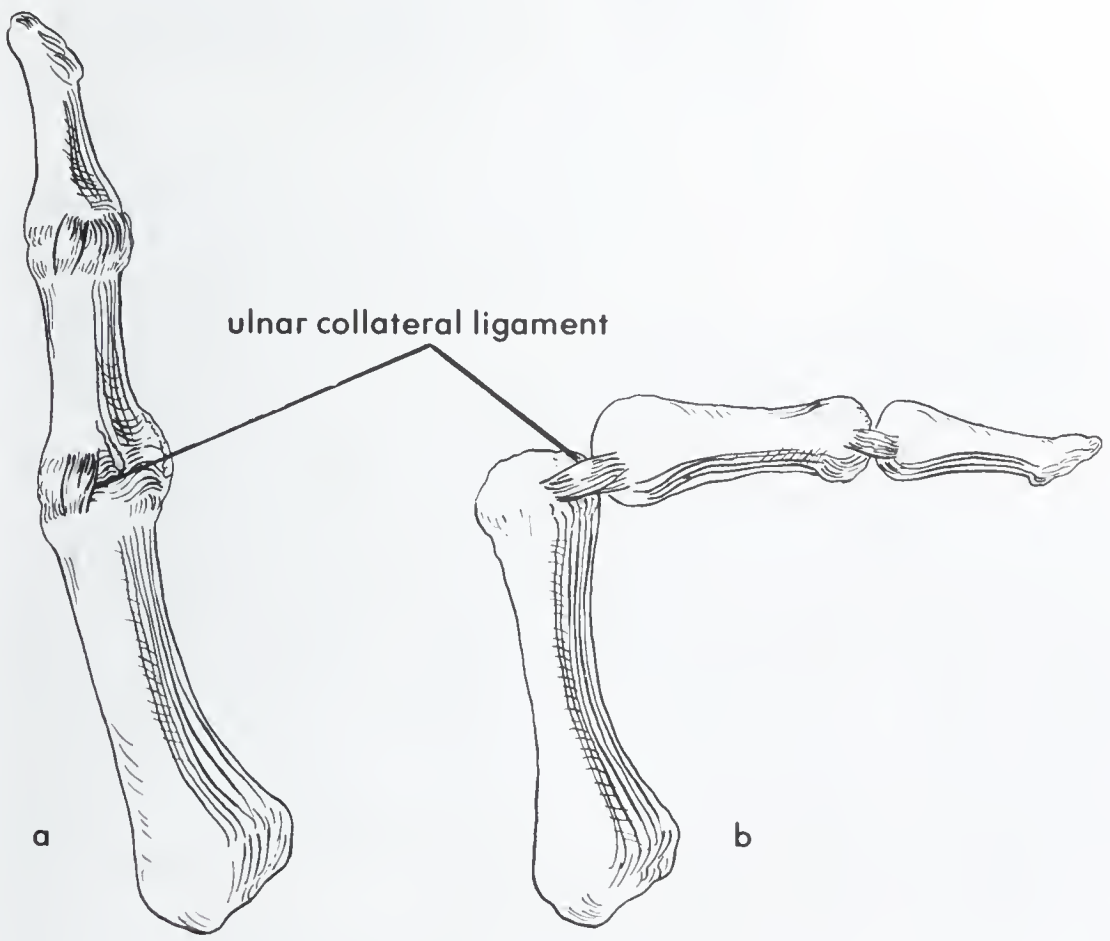

Fig. 1a - Ulnar aspect of the metacarpophalangeal joint of the thumb. Fig. 1b - The collateral ligament is relaxed in extension (left) and taut in flexion.

Other ligamentous structures in the MCP joint include the palmar ligament, a thick, dense fibrocartilagenous structure on the palmar surface; the radial collateral ligament, which is the contralateral counterpart of the ulnar collateral ligament; and the accessory collateral ligaments which, together with the palmar ligament, attach to the sesamoids to form a central cartilagenous plate and base attachement for the flexor pollicis longus (Fig. 1).

Adding further stability are the surrounding intrinsic muscles of the thenar eminence. The tendons of the abductor and flexor pollicis brevis provide radial stability while the adductor pollicis adds to ulnar stability (Fig. 2). However, when the ulnar collateral ligament is disrupted, the intrinsic muscles are not sufficient to maintain the mechanical stability of the joint.

The collateral ligaments are taut in flexion and relaxed in incomplete extension (Fig. 3). In full extension, the accessory collateral fibers pull on the collateral ligament, causing the latter to become taut.

The range and degree of motion of the MCP joint of the thumb vary considerably. Although, in extension there is usually a very limited range of lateral motion of this joint, some people who are very loose-jointed are more free to move the joint in the lateral plane. However, ulnar instability of greater than 35° is always

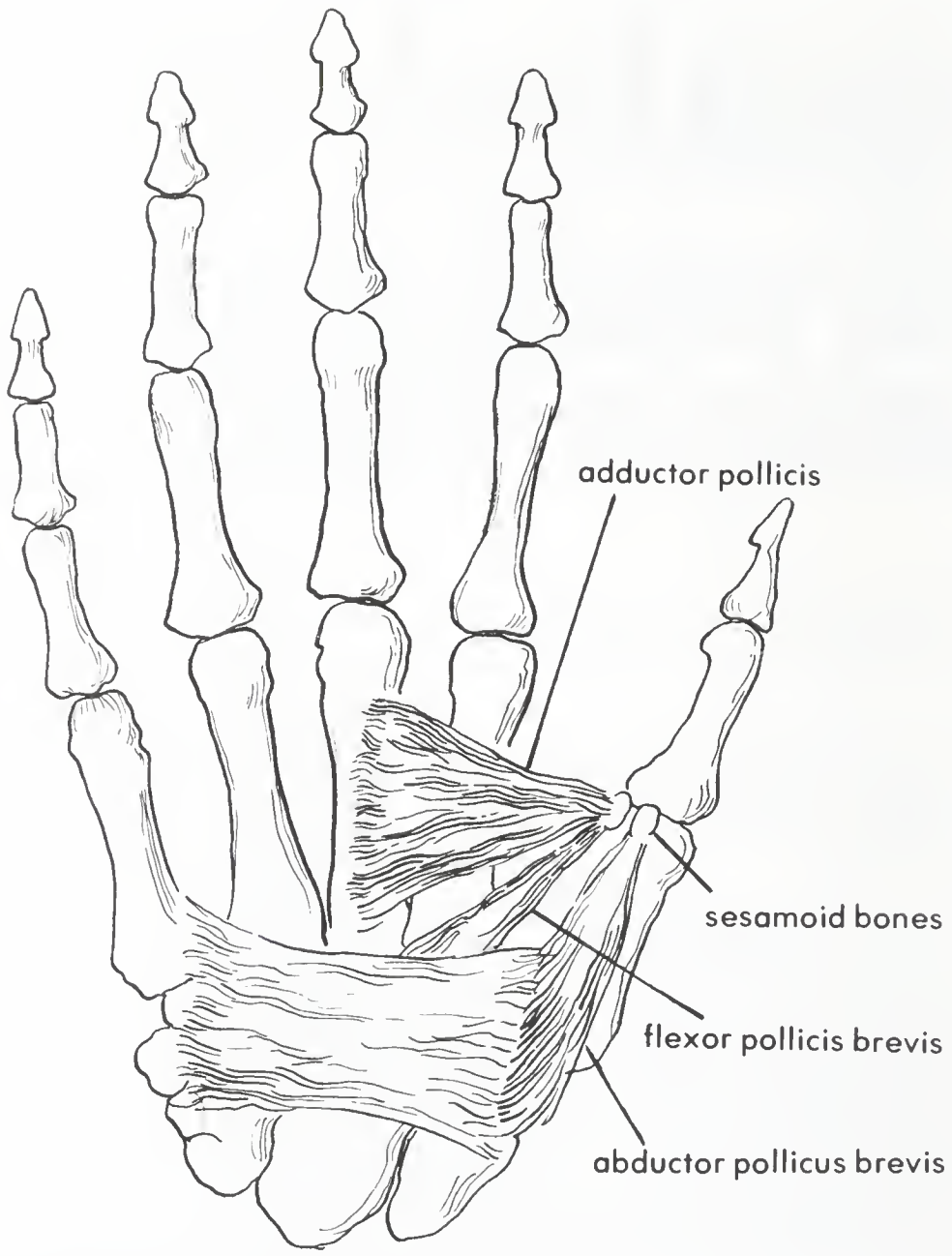

Fig. 2 - Intrinsic hand muscles which stabilize the MCP joint of the thumb.

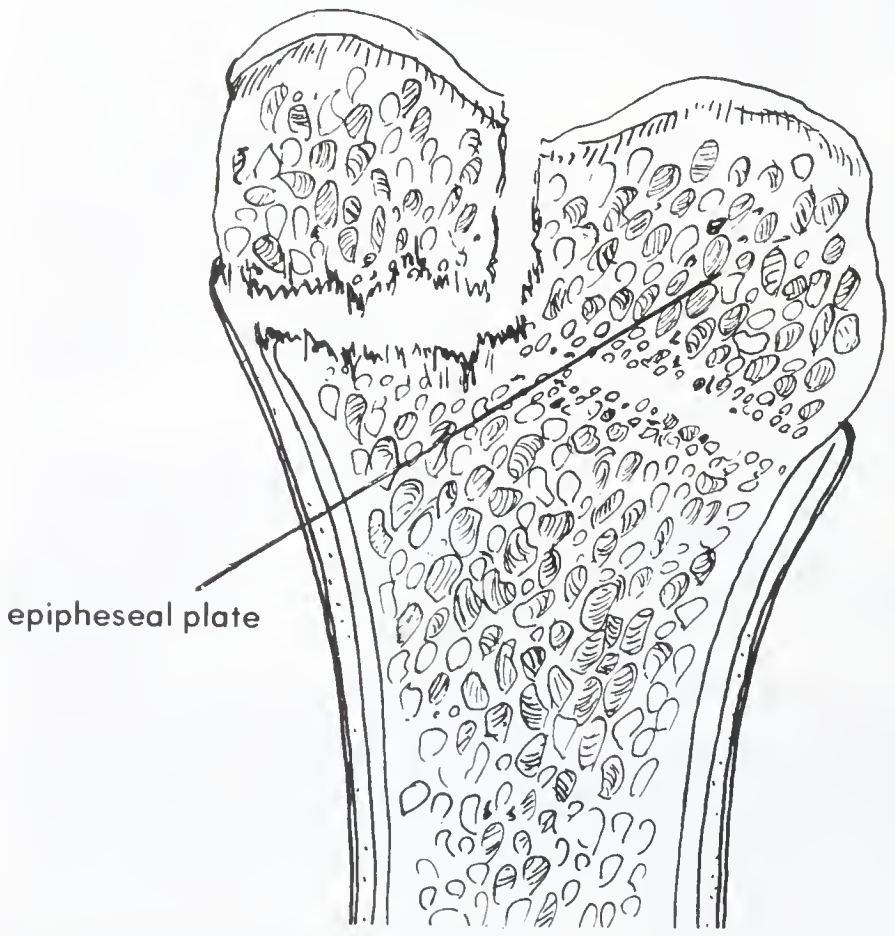

Fig. 3 - Type III epipheseal plate injury: fracture of part of the epiphysis.

considered abnormal. Due to the variation in the range of lateral motion encountered in different normal people, instability of an injured thumb should be determined by comparison with the opposite, uninjured thumb.

The Gamekeeper's Thumb Injury

Through common usage, the term "Gamekeeper's Thumb" refers to the injuries of the ulnar collateral ligament of the MCP joint of the thumb. Such injuries can result from acute trauma or from repeated stretching.

Insufficiency of the ulnar collateral ligament was found to be an occupational characteristic in the hands of British gamekeeprs, whose duties included the control of the rabbit population in game parks. Apparently the rabbits, when allowed to proliferate, depleted the grazing areas of other game animals such as deer. The gamekeepers therefore set traps for the rabbits. Since these traps captured but did not kill the rabbits, the gamekeeper had to manually break their necks, thereby applying lateral stress to the MCP joint of the thumb. Although this action did not necessarily result in an acute tearing of the ligament, repeated maneuvers of this type could ultimately stretch the ulnar collateral ligament to the point of chronic laxity.

A sudden abduction of the MCP joint can cause an acute partial or total disruption of the ulnar collateral ligament. Accompanying tears of the dorsal capsule may occur as well, but the primary injury is to the collateral ligament itself. Following the acute injury, the patient presents with diffuse local swelling and pain in the region of the joint. Usually the point of maximal tenderness can be localized to the ulnar collateral ligament. Varying degrees of lateral instability can be shown by application of valgus stress, and by comparison with the opposite, uninjured thumb. Lateral instability due to Gamekeeper's Thumb may cause instability of pinch, thus interfering with this important function of the thumb.

The severity of injury to the ulnar collateral ligament may range from a mild stretch to a complete rupture or avulsion. In the latter case, routine

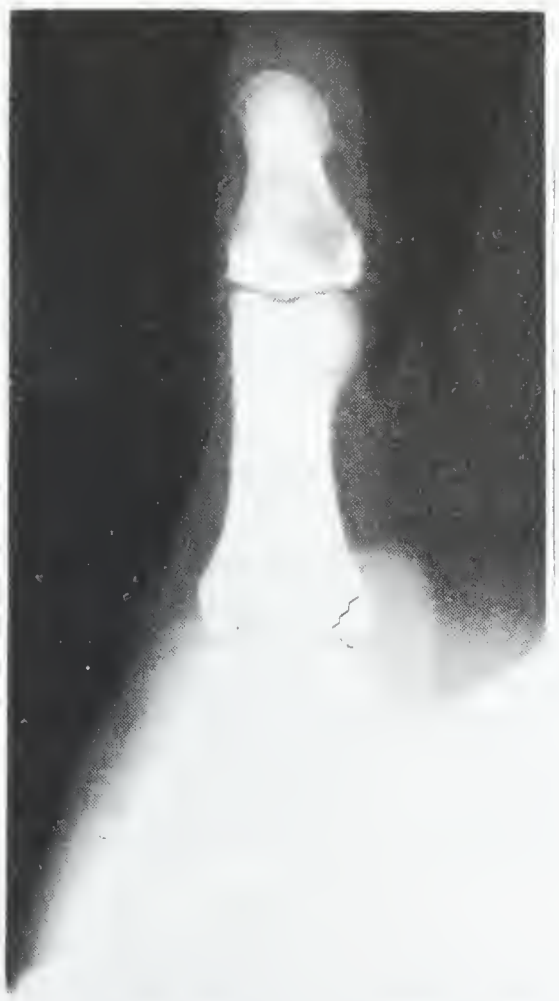

Fig. 4 - An undisplaced diagonal avulsion fracture of the base of the proximal phalanx of the thumb.

Roentgenograms may show no abnormality or may demonstrate a variably sized avulsion fracture at the base of the proximal phalanx. (Fig. 4). The presence of an avulsion fracture chip indicates that the ulnar collateral ligament is completely disrupted.

Treatment of Gamekeeper's Thumb

As previously mentioned, treatment can consist of open surgical repair or conservative immobilization in a cast.

There is general agreement that partial tears of the ulnar collateral ligament can be satisfactorily managed by non-operative methods. In contrast, there is disagreement abut the proper treatment of acute complete ruptures of the ligament. Complete ruptures are treated by either operative or conservative methods in different centers.

When open surgical repair is the selected method, a variety of techniques may be necessary. Most complete tears involve an avulsion of the ligament from its distal attachment to the base of the proximal phalanx, with or without a small avulsion chip fracture. These are treated by internal fixation of the avulsion chip back to its bony bed. those less common injuries in which the ligament is torn through its substance can be approximated with direct suture. It is usually necessary to detach, and later repair, the intrinsic muscle tendinous insertions into the base of the proximal phalanx in order to expose the ligaments and joint capsule. Following surgery, the thumb is immobilized in a thumb spica cast for 6 weeks.

Conservative treatment usually consists of immobilization of a 6 week duration in a thumb spica cast (Fig. 5).

Study Results

A series of 26 patients was treated conservatively at the Toronto General Hospital Fracture Clinic. The 26 patients included 16 males and 10 females ranging in age from 13 to 57 years. Their injuries occurred between December, 1975 and May, 1978.

Description of the Injury

Of the 26 injured thumbs, 19 were on the right hand and 7 on the left. The injuries occurred as a result of:

skiing accidents - 15 cases
fights - 5 cases
other accidents - 6 cases.

The last category includes falls on ice, a fall off a motorcycle, a thumb struck by a basketball, a thumb hit against a door, and one thumb caught between two rollers in a factory.

12 injuries were accompanied by an avulsion chip fracture. In 10 of these, the chip came off the proximal end of the proximal phalanx. One of these involved a type III epiphyseal plate injury (Fig. 6) in a young boy. The epiphyseal injury healed following a 3 week plaster immobilization. In 2 cases there was an avulsion chip off the distal end of the first metacarpal.

14 injuries were free of fractures. Of these, 5 involved a complete tear of the ulnar collateral ligament while 3 involved only an incomplete tear. In 6 cases the records were not indicative of the degree of disruption to the ligament.

There were no significant associated injuries in any of the 26 cases of Gamekeeper's Thumb.

Description of the Treatment

The thumbs of 21 patients were immobilized with a thumb spica cast. Two other thumbs were immobilized in a reinforced volar splint incorporating the palm and distal forearm, held in position by flannel. The volar splint produced essentially the same type of immobilization as a thumb spica cast. Another patient used transient taping of the thumb whenever it became painful. In two cases the thumb was not immobilized at all.

The time interval between injury and treatment was:

two days or less in 19 cases
one week in 2 cases
two weeks in 3 cases
not recorded in 2 cases.

The duration of immobilization was usually 6 weeks or 4 weeks but was variable:

6 weeks. . . . . 9 cases
4 weeks. . . . . 8 cases
1 week. . . . . 1 case
2 weeks. . . . . 1 case
3 weeks. . . . . 1 case
7 weeks. . . . . 1 case
not recorded. . . . . 2 cases

Results of Treatment

At the time of removal of the cast or splint, or one to two weeks thereafter, there was not a single case of residual instability. There were only very minor complaints of discomfort in the form of tenderness and stiffness on removal of the cast in 5 cases. In one case there was pain on abduction of the thumb accompanied by a mild limitation of abduction but the difficulty later subsided. Thus, the results indicate that the conservative method provided satisfactory results in the treatment of Gamekeeper's Thumb, especially by restoring stability which allowed for normal pinch.

11 of the 26 patients could be contacted for long term followup. Six months to two years after their treatment, only 3 patients complained of pain or limitation of extenstion of the MCP joint, but all three of them had reinjured their thumbs in ski mishaps after their treatment at the T.G.H. Fracture Clinic. The remaining 8 patients in the long term followup suffered no instability or pain, although two of them complained of a slight irritation during cold weather or weather changes. These results again indicate that the

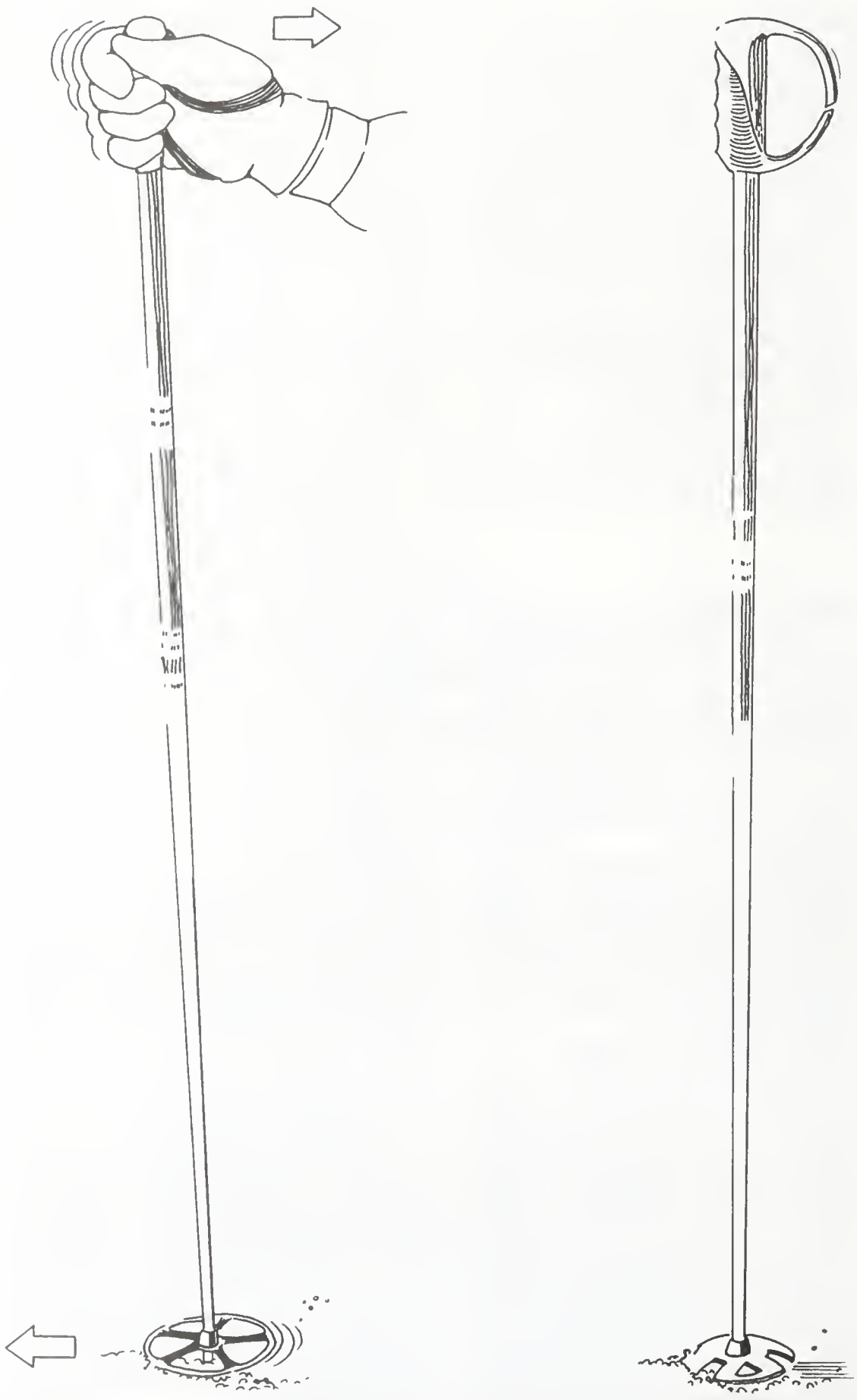

Fig. 5 - The conventional (left) ski pole and strap. Arrows show forces acting on the pole during a fall. The pole on the right features the plastic "breakaway" handle.

conservative method produced satisfactory results.

The Role of Conventional Ski Poles in the Mechanism of Injury

The predominant circumstance for the Gamekeeper's Thumb injury in this series was a ski fall. Although some of the patients could not recall the exact sequence of events leading to their injury due to the suddenness of their fall, others could remember enough to implicate their ski pole and its strap. A common mechanism of injury is as follows: During the fall, forward force is applied to the bottom end of the pole. The conventional strap grip is held in such a way that the strap acts as a fulcrum. Thus, the top end of the ski pole applies a backward force on the thumb, stressing it radially (Fig. 7). High velocity skiing is especially implicated in such injuries. It is therefore advisable to use "breakaway" ski poles, which have either a quick-release strap which detaches from the pole at high tension, or a plastic hand guard which is flexible enough to allow the hand to escape (Fig 8).

Healing of Gamekeeper's Thumb

The argument for surgical repair of a completely torn ulnar collateral ligament claims that a precise ligamentous reconstruction is necessary after the injury distorts that ligament. Furthermore, if there is an avulsion chip fracture, it is claimed that the chip must be fixated back in its bed surgically.

In conservatively treated Gamekeeper's Thumb injuries, healing takes place by fibrous union if the ligament is avulsed without a fracture, or if it is torn through its substance. Even though the ligament is not regenerated identically to its original structure, enough scar tissue forms to retain the stability of the joint. When an avulsion chip fracture is involved, conservative treatment results in callus formation and healing of the reduced fracture. If the avulsion chip is displaced, healing occurs by fibrous union of the bone fragments.

If the injury involves a highly displaced, large avulsion fragment, then surgery is indicated, especially if the large area of the joint surface is included in the fracture. However, such injuries are rare.

Summary

The review of the conservative treatment of 26 acute Gamekeeper's Thumb injuries suggests that non-surgical techniques provide satisfactory results in the treatment of Gamekeeper's Thumb, even when the ulnar collateral ligament is completely disrupted. If the injury is only to the ligament, or if it is accompanied by a small avulsion chip, conservative treatment appears to be sufficient. However, a case can be made for the need of surgical repair if a large displaced avulsion chip frac-

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Medical Alumni Association Writing Contest

The Sun God

by John Young 8T1

People are always saying that their high school started to go downhill the year they graduated. Our class said it too. When we were standing backstage on Commencement Day, waiting to get our school letters, Janice Delano turned to me and said, "Well, they'll never have another year like **this** one." We felt like a tight cloud of bees which suddenly, mysteriously rises and abandons its hive. We chose not to notice the drones who had slowly been taking our place; and we tried to ignore the winds of circumstance which would soon rend and scatter our chummy swarm.

And yet, for all the wrong reasons, we were right — Northwestern never really was the same after we left. Because our year had the first, and only, Sun God contest.

It is mid-May, about three weeks before final exams. Most of us grade thirteens have high enough marks to be exempt. University acceptances and scholarships have been awarded; for many, life plans are already made and delegated to a back corner of the mind. As a result, student activist Howard Zimmerman, sitting in front of me in HIS 531, is finding it hard to concentrate even on this, his favorite subject; for with such important personal decisions already out of the way, who can be bothered with Bismarck? I see his eyes, his mind, start to wander around the room, but there is nothing in this cloudy day to fill the void.

And then, suddenly, through a tear in the grey sky, it is here: the sun, the first hot summertime sun of the year. It enters without knocking. Earlier, fiercer than ever this year, it blasts through the skylights of the pool and bathes the Remedial Swim class in warmth and brightness. It pats the head janitor on the back for the fine job he has done in planting the front flower beds. And it surges through the windows of HIS 531 and places a golden benediction on the head of Howard Zimmerman, who melts in his chair and longs to be outside. Such is the power of the sun, that it can distract even a high school Marxist from his cause. The teachers try to shut out its call with venetian blinds, dusty from a winter of inactivity, but it is no use; it insinuates itself between the slats and now scatters its glow in a hundred columns of light.

It is not that the teachers do not welcome the sun, but they know it is an anarchist, capable of filling a younger, less patient heart with discontent. Its lethargic heat slows the clock, turning days spent within red brick walls into a sentence served in a prison fortress. In fact, Mr. Duncan, the Latin teacher, feels just like a warden as he extinguishes another small fire started on one of the toilet seats in the first-floor boys' washroom. He has been at Northwestern since it opened, and he knows the signs of restlessness. Ms. Halicki, the new vice-principal, sighs as she looks out her window at the technical students, scattered over the front lawn and newly planted flower beds. These students must be skipping classes because the technical classes are deliberately scheduled without intervening spares, to remove any temptation of skipping. Now that the weather's good, she realizes, it will be harder than ever to coax these kids back indoors. And this is disappointing to her, because she realizes that her first year at Northwestern will soon have passed without the attainment of her goal: "to unite the technical, business, and pre-university students in a spirit of cooperation and fulfillment through education." She is new here; the older teachers remember their first years, and humor and protect her.

Cheryl van Horne takes up her usual position against the flagpole, next to the front driveway, and draws hard on her cigarette. She is not like the others; she really **enjoys** smoking. Today the sun makes her feel like a snake about to shed its skin, and she tosses her blond hair back and squints up at its force. She is with some friends from her typing class, which is currently in progress. Her tank top and jeans are too tight; in the past, she might have had a reputation, but now all she has is a running appointment with the detention supervisor. She glances at the school, and is amused when Ms. Halicki's drawn curtain quickly falls back into place.

Mr. Martin has just completed demonstrating the second-last chemistry experiment of the year, and now

his class is filled with the din of Bunsen burners and iron rings being pulled from wooden drawers. As he steps outside to watch for stragglers in the hall, an old feeling comes upon him, as it does every year at this time: "soon I will be losing my grade thirteens, but next year I will get a new set. Every year I am a year older, but my class stays the same age". He thinks of a friend his age, a teacher in another high school, who solved the dilemna by marrying one of the many female students who had a crush on him. He idly wonders if perhaps they have a blackboard at home, to sustain the atmosphere in which the contract was conceived; smiling, he returns to the classroom.

The morning wears on without incident, but in the afternoon a bell shatters the silence of the corridors: Mr. Jacobson, the principal, has decided to hold a fire drill, in view of the recent outbreak of small fires. It is a fatal mistake; once outside, the students bray and balk at returning to classes. The rest of the day is an unruly one; even Jane Moran, a top student, is reprimanded for talking all through her English Lit class. Clearly, Northwestern has lost round one.

It slices in weightless planes across all ages and intellects; this is what makes the sun such a formidable enemy — so formidable that its name is not even mentioned, at first, in the discussion of vacation plans taking place this morning in the staff room. The conversation passes, along with cups of coffee poured from the percolator, from Mr. Dixon to Mr. McIlroy and then to Miss Demeter. Mr. Dixon is the head of the Biology department, but he is actually younger than the other two; and in the staff room at least, the three science teachers are equals, bound by a love of their subject that sometimes reaches across the desks and embraces their students, too.

Slowly the topic changes to a consideration of what will be the theme of this year's Science Show — an annual year-end presentation by the Biology staff, held mainly for the graduating class. Mr. Dixon is in favor of abandoning the project, having run out of new ideas after the seventh show two years ago; but Mr. McIlroy wishes to continue the tradition, and speaks once again of his desire to do 'some sort of presentation on energy'. 'Too broad a topic,' complains Miss Demeter; Mr. Dixon suggests that the field is too theoretical to provide any sort of inexpensive and practical demonstrations. Suddenly an answer materializes.

—Well, why not just focus on one area — say solar energy? There's plenty of cheap possibilities there...we can start fires with magnifying lenses, that's spectacular and we can make a solar cooker, serve the kids some kind of food.

—Another thing we could do is set up one of those miniature biosystems with a mouse and a fern in a vacuum jar — explain how the plant turns sunlight into oxygen and food for the mouse and all that.

—And we can put the whole thing on in my dad's barn, Andy! You write the music and I'll be the star...

They laugh at Miss Demeter's sarcasm because she shares in their enthusiasm: they are all relieved to have found an answer. As the percolator drains, their ideas begin to expand to include the drafting and shop students, who might be convinced to design and build a solar water heater; the physics department, which has some spare money which could be spent on radiometers and solar batteries; and why not enlist the help of the art department, which this year has several talented grapics students? In fact, Mr. McIlroy suggests boldly, the entire school could become involved. He even has a name for the event — Sun Day. The bell signals the end of their spare, and, entering the hall, they are swept off in a flood of students, dispersing their inspiration throughout the school. The solution to the onslaught of the sun has been found — surrender.

Of all the people at Northwestern who rejoice at the return of good weather, surely the most quietly jubilant must be Sarah Katz; now her long walks to school, hefting her bassoon for early-morning orchestra practice, are bright and filled with the noise of life, not suffocated in grey blankets of cloud and snow or drowned in dismal rain. It is not exactly dedication to excellence in her music that rolls her out of bed this morning, earlier than her parents, and brings her to sit, bleary-eyed, in a deserted music room half an hour before the others arrive; rather, it is the curse of her honest, practical mind. Sarah knows she is a good musician, but not a great one; and in any case the job market for bassoonists is limited, to say the least. Her musical career will end after the Commencement Day exercises for which she is here to rehearse; meanwhile, she simply wants to play as much as she can. She yawns and moistens the reed on her instrument, and the baleful, beautiful sounds of the woodwind begin to fill the room.

Down the hall in Gym 2, Mrs. McLennan is coaching the senior girl's basketball team; the members were once awkward and ungainly, but now she has given purpose to their extra height and bulk. She is pleased that the sun is out, for now she can take her gym classes outside, where they belong. Later in the morning, she is a Zookeeper — a cafeteria supervisor — and once again she is grateful to the sun: the good weather means most of the students can eat their lunch outside, and relative peace prevails. The fire exit doors are flung open and a warm, erotic breeze blows in.

Paul Baker is the top athlete, the top student, in the class; popular, handsome, and agile of mind and body. He is also my best friend: the crowning jewel in my bracelet of acquaintances. He is talking to Mr. Carlyle, who would normally be showing him how to get a faster start off the block; but today a desk and a sign on the wall that says Guidance Department, has come between, redefined them. Mr. Carlyle eyes the clock, realizing that soon he will be late for the staff meeting, but Paul seems to be stalling. As they talk, the pit in Mr. Carlyle's stomach returns, a vague uneasiness first felt when he saw Paul's name on the Counselling sign-up sheet: why would someone as sure of himself as Paul need counselling? He had put Paul's name in his appointment book, figuring that their acquaintance might be of some use in the ensuing discussion; but now he wishes he had listened to his wise stomach, for their relationship simply casts a veneer off which all of his comments reflect.

—Well, part of what I wanted to see someone about was...I've been wondering about university.

—You shouldn't worry about that now, Paul —the year is almost over, you have a whole summer ahead. Besides, you're a brilliant student, you won't have any problems.

—No, actually, what I mean is...I'm wondering...oh, I don't even know if I want to **go**.

There is a brief, stunned silence — everyone knows Paul has his heart set on law school. Other students have come in, uncertain about their futures, but Paul is a leader — of the track team, the stage crew, the student paper — he makes decisions for others. Now Mr. Carlyle is in an alien land; a stranger sits across from him. He fills his recovery time with empty words, then embarks on an anecdote about how he, too, was unsure of himself, and even considered dropping...about half way through his story he summons the courage to look at Paul's face: he is staring blankly at Mr. Carlyle's whistle. Mr. Carlyle glances down, sees the whistle resting just above his paunch. He thinks he can read Paul's mind: what am I doing here, getting advice on how to run my life from a fat gym teacher? The anecdote is cut short; the conversation becomes jovial and distant, as it was at the beginning. Mr. Carlyle mentions Sun Day in passing, suggests that if it takes place, Paul might like to head the student organizing committee; Paul says it might be more fun to just spectate for once. Who is this impostor?

—Well, Paul, I've got to go to a staff meeting now. But I want you to come in again when there's more time to talk.

—Oh, okay. Thanks — you've been a great help already.

—Well...Oh, and Paul, you weren't at the track practice this morning.

—Sorry, Mr. Carlyle. I've been really tired lately and I slept in.

—You look thinner. You feeling okay?

—Oh, yeah. Probably just a touch of flu.

He does not mention that track practice feels pointless, nor how much this feeling frightens him.

If Mr. Carlyle is wondering why Paul in missing practice and classes, he should hang around the lockers when school is out: the students have all the answers. The current hypothesis — espoused by Kim Russell as she sniffs her gym bag and decides to take it home before it gets up and walks away — is that Paul's relationship with Diane Kovak is a "purely physical thing, it's left him totally empty"; she secretly hopes that her pudgy, pimply body may one day fill his vacuum.

Even Paul's younger brother, Jim, doesn't know what Paul finds in Diane that others have missed; sometimes Diane wonders herself. True, she is blandly attractive, but she is also tough and coarse, with a sense of humor some would call vulgar and a poisonous, if honest, tongue. Branded unfeminine by male and females alike, she has few friends other than her Mineral Club members. As she stuffs her books in her locker, around the corner from Kim's, she smiles inside. One thing she knows for sure: whatever it is, it is more — and less — than physical.

Mr. Gomez opens the library door for Mr. Carlyle, then pads back to his seat as Miss Halicki finishes enumerating the many possible benefits of Sun Day. Most of the teachers are enthusiastic—except for the English department. The are opposed on two grounds: reflexly, because they are ideologically opposed to the pragmatism of the Science departments; and pragmatically, because they cannot think of anything their field can contribute. They complain of the money involved.

The meeting grinds on; the sun, the object of their concern, is a blood-red wound in the mellowing afternoon sky. A vote is taken; it is official. Next mornng, the disembodied voice of Jeff Blustein, Student Council president, will announce over the P.A. system the tentative date for Sun Day (weather permitting) and suggest, in nasal tones, that all students get involved.

Does a school have caffeine in its arteries? The students empty the cola machine in the Zoo, inserting their quarters and receiving their rewards like trained pigeons; and in among the black draperies of the Theatre Arts department, Miss McMahon sips her third jasmine tea of the morning. She is attempting to define the Essence of Sun Day; a drama teacher, she deals in archetypes. What is the sun? she asks, and finally she answers herself: hedonism. The sun is a god that speaks the language of the body; the Greeks understood that — they, too, were an egotistical society. She leaps from her chair, flows about the room, catlike in her leotard, thinking. It is no time before she has her contribution worked out: a contest to determine the supreme hedonists, male and female: a Sun God and Sun Goddess. Both staff and students may enter; a panel will judge Beauty, Grace, and Tan. And, unlike a mere beauty pageant, it will be anonymous — the entrants will wear numbered masks to obscure their identity. She pirouettes and glides about the darkened room, mops her scarlet face and hair with a towel, and then, in preparation for her first class, bellows guttural noises which fall lifeless against the soundproofed walls.

Perhaps it is Marie Armand's clever bristol-board advertisements; or maybe it is the opportunity to find out, finally and forever, how one's body rates; or possibly it is something deeper, more insecure; in any case, the flies of gossip buzzing around the lockers speak of nothing other than the contest, and many raunchy evaluations are made in the change rooms. Mr. Martin wonders why his chemistry class is so empty; soon he is seen gaping out the window in disbelief. Some of his best students are laying, half-clothed, in the field behind the school: I am one of them.

The sun has obliged our worship; a white-hot boil in the sky, sometimes it seems so large that it might be descending to annihilate us in a fiery kiss. There are scores of us: beached fish, we plop from one side onto the other, frantically trying to purge our skin of its fluorescent pallor.

The air vibrates with giddy fun, tempered with a steely edge of competition: Kim Russell hovers in a bikini over her friend, Lousie Brown, and asks if she can borrow her bottle of suntan lotion, from which the label has been removed.

—Sorry. Get your own, like everyone else. And get out of my sun.

—What kind of lotion are you using?

—None of your business!

—Oh, for God's sake, you'd think it was exam time or something. She lowers herself onto her towel, pulling her damp hair back from her forehead

The teachers are more discreet: When Mr. Jakowski, a math teacher, calls in sick, nobody suspects that he has fallen asleep under his sunlamp and singed his eyebrows off. And Mr. Thompson, my French teacher, saves his

weight-lifting until first lunch, when all the gyms are empty.

The week progresses; the competition narrows. I have spent too much time in the sun, and a potential tan is now a vicious, agonizing burn; red-faced, I must return to the classes from which I was truant, and face the condescending appraisals of those teachers who cannot grasp the potential glories of becoming a Sun God.

It is Sun Day.

At first, the weather appears less than promising: as the teachers and student demonstrators arrive at the school to set up their exhibits, thunderheads darken the horizon. But then the monster awakens, lumbering out of its hiding-place and searing the clouds to oblivion; a hell-furnace, it roars even this early in the morning, makes the vinyl chairs in the front office too hot to sit in. How long has it waited to be honored like this again?

The rest of the students begin to arrive; we are greeted in the front foyer by a startling mosaic of the sun. Depicted in the familiar old style, a grinning face from which tentacles of light arise, it is a collaborative effort of the art students and will be on permanent display.

We proceed into the auditorium: Mr. Dodd, the conductor of the orchestra, has arranged a selection of appropriate tunes, ranging from "Thus Spake Zarasthustra" to "Here Comes the Sun". We might be more respectful, less talkative, if we were to know that Mr. Dodd has leukemia; if we listened, we might hear the joy in Sarah Katz' playing — the Music department has sagely chosen her as its outstanding student and awarded her an engraved bassoon. Instead, we wonder aloud who will be the Sun God and Goddess.

Mrs. Lowry's eyes wander from the student she is addressing and quickly assess the integrity of the scale model of Versailles. The history teacher has arranged an impressive exhibit of the reign of Louis XIV, the Sun King; an art teacher keenly aware of the value of audio-visual aids, she has displayed many full-colour photographs of the gold and silver objects of that age. The model was once a forgotten relic of that brief era when schools fit their budgets to their ambitions, and not vice-versa; now giant eyes hover over its elaborate architecture, and imagine themselves in a world of opulence and splendor.

In room 232, the Home Economics class has an explanation of how the sun provides vitamin D, and an amusing display of "Swimwear Throughout the Ages"; many of the older examples were actually made by the students, who designed them from old photographs. Parasols are scattered about the room, and there are samples of an impossibly yellow, new recipe called 'Sun Day Pie'; few are brave enough to try it.

In room 118, Barbara Davis, authoritatively clad in a lab coat, explains how the mouse manages to survive even in a vacuum jar; a reporter from the school paper listens intently, nibbling on a melted cheese snack which was cooked in the solar oven. There is a display on fusion, with arrows leading to the Physics room, and a miniature greenhouse. Every hour, Miss Demeter and a physics student put on a show, 'Light Fantastic', explaining the biological and physical properties of light. They start fires with lenses, connect a small motor to a solar battery, and end with demonstration of the school's portable laser, including holograms; the crowd is fascinated and entertained. In the corner of the room, largely ignored, there is a small display of fluorescent rocks by the Mineral Club.

It is late morning as the contestants unpack themselves out of their jeans and into their bathing suits; at the stroke of twelve, two deities will be chosen. Laughter and conversation, once the attendants of the change room, are now outcasts; single-file and silent, the entrants worm their way to the side doors. Before the procession onto the playing field begins, each receives a brown paper bag with two eye-holes on the front and a random magic-marker number on the back. This is the anticipated moment: the mask in place, each is defined entirely by his or her body. At the last moment, a student in the middle of the line hesitates, then turns around and fades off down the empty corridor.

The entire school awaits outside.

The sun has almost ascended all the steps to its throne; impatient and enraged, it screams white heat and fills our lungs with steam as we sit on the blistering bleachers. Steven Oreste, who is photographing the event for the yearbook, makes the mistake of leaning against the metal equipment shed near the playing field; now he is doubled over in mute agony, his right hand hot and shaking as a febrile patient.

The five judges—Mr. Jacobson, Mr. Dixon, Ms. Halicki, Mrs. McLennan, and Jeff Blustein—are introduced to mixed applause by Miss McMahon, who lugs the portable megaphone back to the table. The judges sit down and pick up their clipboards; they are smiling and talking to each other as if this is not a serious matter. From somewhere there is a trumpet fanfare, and the ritual begins.

And in the stands, the ugly, the awkward, the cowardly all observe the spectacle: it is an audience of freaks watching normal people perform, a side show in reverse. I sit near the top and try to figure out which number is Paul, which one Francine, which one Mark; a certain walk, a birthmark glimpsed in the showers—These are my clues. For the most part I am unsuccessful. The final competitor parades past the judges' table, and then all are on display for one last time: casts of bronze, tempered by the sun. There is a ten-minute break as the judges tabulate their scores.

Steven Oreste has finished his last roll of film; to get a new one from his locker and return in time for the decision, he must take the stairs to the third floor two at a time. But as he races down the hall, a glimpse of something unusual reins him in; walking back to the men's room, he finds tendrils of smoke crawling our from under the door. Cautiously, he pushes the door open, and a nebulous grey blanket issues forth, diffusing the light within; he enters and approaches the stalls. The seat in the first one is on fire; he turns to run for the fire alarm, but then notices that the second cubicle's door is shut. Crouching down, he sees a pair of legs...Hey, what are you doing? There is no answer. You okay? He advances further into the washroom; the seat in the third stall is also on fire. Now the blood is drumming in his temples: something is wrong here. He removes his camera from around his neck, gets down on his belly, and shimmies under the door of the second stall.

At first, his mind cannot assemble the clues: a bottle of lighter fluid, a gun on the floor—he has never seen an actual gun before—a third hole, singed around the edges, in the paper mask covering the slumping body's face. He stands up and shakes the body—it might be an O.D.—and it starts to slide down against Steven's leg. Hey, wake up!...and he pulls off the mask. He screams, muffled by the dense smoke, he careens wildly around the confines of the cubicle, like a cornered rabbit, while what remains of Paul Baker's face thuds onto the floor and stares blankly into infinity. Paul's tortured fire has finally gone out.

Cheryl van Horne assumes her usual position, lights a cigarette before embarking on another long day of truancy. Glancing up, she sees the flag flying at half mast—Who died? she wonders—and, beyond that, the omnipresent sun, beaming down its approval of the newly crowned Sun Goddess. Of all the staff and students at Northwestern, perhaps only she really understands that you can't rush a good tan.

The third-floor washroom is doing good business today; like ants on a carcass, the students hover around the stalls on the off chance that the janitor's detergent may have missed a spot of blood.

The head janitor arrives at Paul's locker, places the cardboard box to one side, and fishes out the combination he was given at the office. As the metal door clangs open, an envelope flutters to the ground; it is a note of thanks from Paul to his parents, to Diane, to his brother, to me. The absolutions will salve the guilt, but not heal the wounds. The grey old man removes Paul's sweater and books and begins to layer them in the box.

Diane Kovak is a geologist now. A small magnifying lens about her neck, a pair of steel-toed boots laced up her shins, she hauls her stony heart across barren lands.

Myself? I am a casket-bearer at Paul's well-attended funeral—I never realized this goes with the territory of friendship—and afterwards I think about him; I think about him more in a half hour than I did during the two weeks before Sun Day, when I barely noticed his absence from classes, the bottomless sadness in his eyes. At Mass, I pray for his soul and fervently hope he roasts in Hell; my emotions are intertwined, I will probably never untangle them. Finally, I am forced to re-evaluate my own life: for if the achievements of the person in whose light I basked could not bring him happiness, then surely my pursuit of them must be futile. You know as much about what Paul needed as anyone else does; but I know that what he got was the cold thing that causes student and teacher to avoid each other in the supermarket.

And there is never going to be another Sun Day, although the grinning mosaic still greets the students of Northwestern every morning. In the staff room, the unspoken reason is that such practices as a Sun God contest promote severe feeling of inferiority; I used to believe that was important, too.

The sun rises and falls every day, and when it breaks out from behind the clouds I am truly grateful for its presence, but I no longer worship it. I have been burned twice. I have learned my lesson. □

Untitled

You can lock yourself
In a thirty-third floor office
In the Ontario Hydro building
And shoot glances out
At the Communist window washers

You can hide out
In the Sidney Smith lobby
Collecting friends like shrunken heads
Comparing sex lives
And MCAT results

You can dedicate your life
To the Party Of Your Choice
And memorize the editorials
And fight for what you believe
And change the fuckin world

Or you can smile for the camera
And dust a place for yourself
Beside the Eskimo sculpture
On the mantlepiece

But still
The sun is a lonely eye
And the clouds break so slowly
As to be painful

Jack Langer

The Medical Alumni Association Writing Contest was judged by Ellen Sokoloff, Editor for Redpath Industries Ltd.

1st. prize prose..... **The Sun God**
2nd prize prose..... **The Lamb**
Bruce Pollock
1st prixe poetry..... **Untitled**
Jack Langer
2nd prize poetry.... *Brett Jamieson*

(continued from page 168)

ture occurs, especially if a large area of the joint surface is involved.

Since there is a high incidence of Gamekeeper's Thumb in skiers using the conventional ski pole, it is recommended that "breakaway" type poles be used instead.

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Editor's Message

This is the last issue of volume LVI.

The *Journal* next passes into the able hands of co-editors Robert Hegele and Dorianne Rheaume.

Special thanks go to my staff, Alan Flancman, typesetters and medical illustrators, Jackie Heda and Adrienne Allison as well as to the various sources of financial support.

Editing the *Journal* has been a tremendously challenging and satisfying job for me this year. An attempt has been made to soften the coldly professional tone of the usual medical journal and to make the *U. of T. Journal* more personable and reflective of the students who study here. People, ideas and extra-medical talents have been featured in addition to quality medical student research.

What can't be printed, however, are the stories behind each article and the faces behind each name. This is the *Journal* I saw and loved working with. It made very enjoyable reading.

Lynn McIntyre 8T0

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